

*A Comparison of Students use of  
Effectuation and Causation Principles  
with that of Practitioners*

MSc in Innovation and Entrepreneurship

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# Abstract

This thesis tries to answer the following question: How do entrepreneurship students' perceptions of venturing, in the context of causation and effectuation, compare to experts and entrepreneurs' paths to success? To answer this question fourteen subjects were interviewed, there were four Experts, five were Entrepreneurs, and the last five were Students. The interviews were coded and analyzed by using S. Sarasvathy's (2001) definitions of effectuation and causation. Each theory has five concepts that were used in this study, examples of these principles were coded for in the interviews to determine whether the interviewees were acting in effectual or causational manner. Eventually we determine prototypes for the different groups which are used to put forth a number of propositions that were helpful in answering our research question. We found that Students are the least effectual among the group and that they fall between Experts and Entrepreneurs when it comes to causational thinking; Experts are the most causational and Entrepreneurs are the least causational.

# Foreword

The authors of this thesis are three students from UiO attending the master program Innovation and Entrepreneurship. We have all worked well together and we have helped each other improve and correct all sections. However, here is an overview of who has been responsible for which sections:

Section:	Main Responsibility by:
Foreword	Ms. Hermansen
Abstract	Ms. Hermansen
Acknowledgements	Ms. Hermansen
1. Introduction	
1.1 Who cares?	Mr. Grepperud
1.2 What do we know, what don't we know, and so what?	Mr. Grepperud
1.3 What will the reader learn?	Mr. Grepperud
1.4. Exploratory interview	Mr. Arteaga
2. Theory	
2.1 Planning or “storming the castle”	Ms. Hermansen
2.2 Effectuation and Causation	Mr. Grepperud
2.3 Can entrepreneurship be taught?	Ms. Hermansen
2.4 Theory Conclusion	Ms. Hermansen
3. Methodology	Mr. Arteaga
4. Analysis and Interpretations	
4.1 Interview presentations	
4.1.1 Experts	Ms. Hermansen
4.1.2 Entrepreneurs	Mr. Arteaga
4.1.3 Students – Centre for Entrepreneurship, UiO	Mr. Grepperud
4.2 Interview Analysis	
4.2.1 Expert Interview Analysis	Ms. Hermansen
4.2.2 Entrepreneur Cross-Case Synthesis/ Analysis	Mr. Arteaga
4.2.3 Student Interview Analysis	Mr. Grepperud
4.3 Group comparisons	All
5. Discussion	
5.1 Propositions	All
5.2 Practical Implications	Mr. Arteaga
5.3 Limitations of the study	Ms. Hermansen
5.4 Future research	Mr. Grepperud
5.5 Conclusion	Mr. Arteaga

Table 1: Main responsibility list

Throughout the thesis period we have each interviewed a handful of people and in the paper these are the people we have analyzed and written about:

Mr. Arteaga: Entrepreneurs B and E, and Students B and E.

Mr. Grepperud: Expert B, Entrepreneurs C and D, and Students A and D.

Ms. Hermansen: Experts A, C, and D; Entrepreneur A; and Student C.

The personal information about the individuals can be found in Appendix 1.1.

# Acknowledgements

We would like to thank all the Experts, Entrepreneurs, and Students who were willing to let us interview them. Without their time and their sincere answers we would not have been able to write anything of this magnitude. We would also like to thank our supervisor Truls Erikson who has helped us from a thesis on a fast course to nowhere to a thesis with a concrete direction and substance. Thank you!



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# 1 Introduction

## 1.1 Who cares?

Entrepreneurship is introduced as a teachable knowledge in a growing number of study programs around the world. The intent of such programs seems to be to teach and learn entrepreneurship as a method. It lies within the nature of entrepreneurship that one idea behind such programs is to make sure that the technology, services, and social systems we need in the future is driven with the best possible conditions to become a reality. One of the more newfound methods for entrepreneurship is effectuation, which was and continues to be developed by Saras D. Sarasvathy. In this thesis we look at differences between Students, Entrepreneurs, and Experts in the context of effectuation and its opposite causation.

Motivation for this thesis sprung from our experience as students of entrepreneurship, our interviews with CEOs of startups at the local incubator Research Park, and discussions on effectuation theory with our supervisor. We were further motivated from our failed attempt to start a new business and the competing debates in entrepreneurship literature between predictive and non-predictive planning. Additionally, there is limited research on the results of entrepreneurship education. Due to both effectuation being quite new in entrepreneurship literature, and how there is very limited research on the result of entrepreneurship education we find the following research question interesting for entrepreneurship research:

How do entrepreneurship students' perceptions of venturing, in the context of causation and effectuation, compare to experts and entrepreneurs' paths to success?

This question has, at least as far as the authors of this thesis know, never been addressed before. At the same time we believe that this will become an important topic and question for entrepreneurship educational programs.

The main objectives of this research are:

- 1 To examine perceptions of venturing approaches and practices of entrepreneurial students and entrepreneurs.

2 To examine the similarities and differences between three groups: expert entrepreneurs, experienced entrepreneurs, and entrepreneurship students.

## **1.2 What do we know, what don't we know, and so what?**

Sarasvathy interviewed 27 entrepreneurs, which she defined as experts. These were entrepreneurs with a continuous high level of entrepreneurship. In her book *“Effectuation Elements of Entrepreneurial Expertise”* Sarasvathy shows how she found how these expert entrepreneurs used effectuation when creating ventures (S. Sarasvathy, 2008, pp. 21-23). Effectuation is the opposite of causation, which was the general view on entrepreneurs prior to Sarasvathy’s work. Experts acting out effectuation have a worldview where you rather do non-predictive planning, this is the opposite of causation where you do predictive planning (www.effectuation.org, 2011). Effectuation is a method, just like the scientific method, and due to this it can be taught (S. Sarasvathy, 2008, p. 308). However, it is stated by Henry, Hill, & Leitch in their *“Entrepreneurship education and training: Can entrepreneurship be taught? Part2”* article that the art and gut-feeling of entrepreneurship seems unteachable (2005b). The authors of this thesis see a connection where effectuation gives room to play out the art and the gut feeling of entrepreneurship.

What we do not know is if and how entrepreneurship student’s perception of what it takes to start up a venture matches the knowledge and experience that is the practical part of venture start-up by Norwegian entrepreneurs, and expert entrepreneurs.

The reason why this is an important and interesting topic lies in the opportunities to look at the practical value of such study programs teaching entrepreneurship. There may also lie implications within a study like this on how to steer the curricula in the direction of expert entrepreneurs, when to teach the students ‘how it's done’ and not purely focusing on the academic, theoretical side of entrepreneurship.

## **1.3 What will the reader learn?**

Our study indicates Students, Entrepreneurs and Experts are mainly effectual. However, Experts are the most causational and are concerned with avoiding surprises. At the same time Students are causational in their hunger for getting investors to fund their venture. From this the thesis presents ten propositions, which both confirms Sarasvathy's work and also gives input on a possible gap in the perception students attending entrepreneurship programs have on how Experts and Entrepreneurs actually do entrepreneurship. This is especially in the sense of their concern for attracting venture investments.

## **1.4 Exploratory interview**

During the previous semester we individually interviewed CEOs of a young technology based start-ups. The interviews led to a trial case study as new researchers. This was also an opportunity for us to work as a new academic research team. After the trial case study project we embarked on developing a thesis research topic with our advisor. The topic was originally unrelated to the trial case study.

We first looked into pursuing a first person research methodology for implementing and researching effectuation theory as an entrepreneurial process. The complexity of such an undertaking became too burdensome and unwieldy to complete in the allotted time. However, during this process we became familiar with effectuation and causation theories. Additionally, we came to recognize hints of the two processes in distinct interviews from the trial case study.

The exploratory interviews and trial case study had focused on the challenges of the technology based start-ups. However, post-trial case study, we realized two interviewees gave impressions of pursuing two different processes of venturing: effectuation versus causation. One CEO (A) discussed and emphasized the importance of setting one's sights on one's goals and developing clear and attainable milestones. The other CEO (B) seemed to be more interested in exploring ideas to see what works and then narrowing his focus. Both firms had signs of growing success and potential of being highly successful. CEO A expected to break-even within a couple of months, and CEO B had landed an important partner who had a slightly different focus from his earlier ideas. The latter is involved in the IT industry, which

provides a higher degree of flexibility from CEO A's firm in biotechnology. While CEO B is a new entrepreneur, CEO A has been involved in several start-ups.

The contrast between CEOs A's and B's apparent approach to business venturing, led us to question how entrepreneurship students perception of the venturing process compares to those of practicing entrepreneurs. Further, what are the differences between different 'types' of entrepreneurs?



# 2 Theory

## 2.1 Planning or “storming the castle”

There has been a large debate regarding the usefulness of business planning for new and young firms (i.e. Castrogiovanni (1996); Delmar and Shane (2003); Honig and Karlsson (2004); Liao and Gartner (2006); Brinckmann, Grichnik, and Kapsa (2010)). This debate has gone on for an extended period of time and the different sides of the story have been given several different names (Brinckmann et al. (2010); Wiltbank, Dew, Read, and Sarasvathy (2006); Brews and Hunt (1999)). However, all these articles are trying to determine the same thing: the impact, if any, of business planning on the successfulness of new or young firms. Wiltbank et al. (2006) collected much of the previous literature and designed a figure explaining how different views compare with each other (Figure 1). The main focus of the figure is to differentiate between theories that emphasize prediction from those that emphasize control. There are four categories that define the levels of prediction and control; Planning, Adaptive, Visionary, and Transformative. The Planning category is the oldest and most commonly known of all, it is positioned in the top left corner, this means that the emphasis on prediction is high while the emphasis on control is low. They define: *“The rational planning view predicts that as uncertainty increases, organizations that work more diligently to analyze and predict more accurately the changing situation in which they operate will outperform those that do not.”* (Wiltbank et al., 2006, p. 985) This is where the theory of Causation fits in; this theory will be explained in detail in chapter 2.2.

Still, in the bottom left quadrant of the figure is the adaptive theories. The theory places little emphasis on both control and prediction. The adaptive theories are described by the following: *“organizations learn what to do next by minimizing the use of predictive rationality, and instead experimenting and moving quickly to capture new opportunities”* (Wiltbank et al., 2006, p. 985).

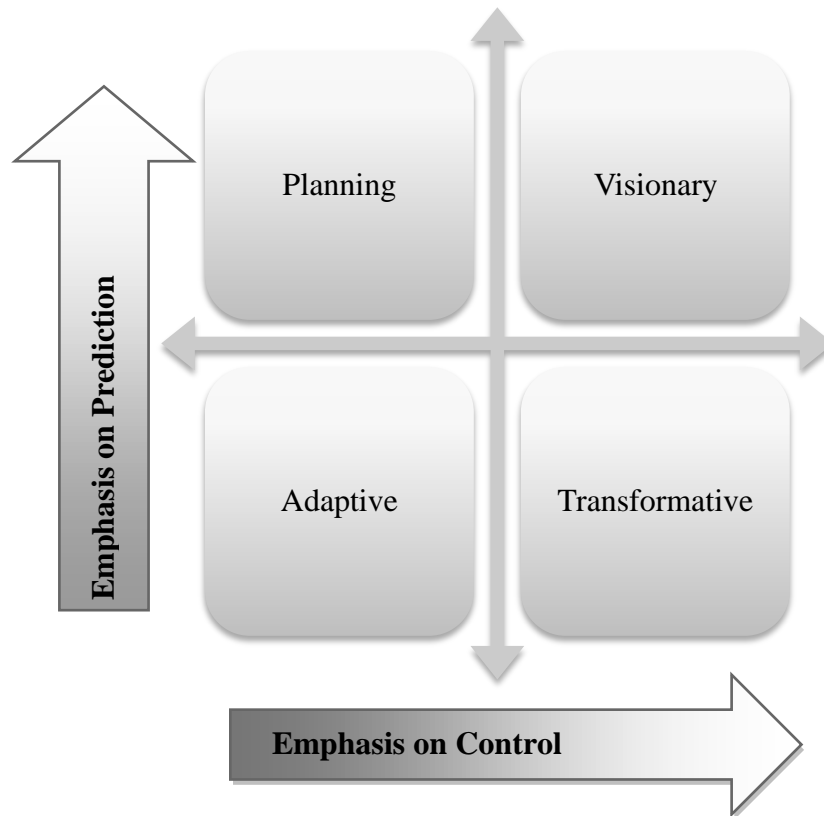


Figure 1: Theories of Entrepreneurship compared with Prediction and Control

When moving to the right side of the figure the Visionary approach is located at the top, these theories have a high emphasis on both control and prediction. Wiltbank et al. wrote: *“This type of strategy emphasizes constructing an organization and its environment by imagining future possibilities and proactively bringing them to fruition”* (Wiltbank et al., 2006, p. 990).

The last square is at the bottom right and there we find the Transformative theories, they have a high emphasis on control, but a low emphasis on prediction. It is written: *“expert entrepreneurs use an effectual logic that is transformative without calling for prediction or vision in creating new markets and new environments”* (Wiltbank et al., 2006, p. 991). This is the quadrant where the theory of effectuation falls, this theory will also be described in more detail in chapter 2.2.

As mentioned, a more detailed description of effectuation and causation will be given in a later chapter. However, first we will take a closer look at the larger picture of the discussion on predictive planning versus non-predictive planning and in effect the top left quadrant and the bottom right quadrant of Figure 1.

By looking at previously published papers we can understand the history and significance of this discussion. The next sections presents in chronological order previous authors' and researchers' works covering these different schools of thought on whether an entrepreneur should plan ahead or just "storm the castle" (Brinckmann et al., 2010).

### **2.1.1 The Arguments for Planning**

The planning debate can be traced back to the 1970s (Thune and House (1970); Ansoff (1979)) and probably longer than that, but going back 40 years does not seem pertinent. In the article "*Pre-Startup Planning and the Survival of New Small Business: Theoretical Linkages*" from 1996, Gary J.Castrogiovanni (1996, p. 803). The main reason he focuses on business survival is that most ventures fail within the first five years, so survival should be on every entrepreneur's mind. Most entrepreneurs strive for growth and profitability and without survival this cannot be possible. The definition of pre-startup planning is defined by Sexton and Bowman-Upton (1991, p. 118) as written by Castogiovanni: "*the process by which the entrepreneur, in exploiting an opportunity, creates a vision of the future and develops the necessary objectives, resources, and procedures to achieve that vision.*" (Castrogiovanni, 1996, p. 803)

Depending on the degree of planning, Castogiovanni says there are planning benefits that leads to business survival. These planning benefits are symbolism, learning, and efficiency. Figure 2 explains some of Castogiovanni's propositions; it is shown that the degree of pre-startup planning can positively affect symbolism such as financing which again leads to business survival. The degree of pre-startup planning also leads to the entrepreneur learning more about the proposed business which then leads to symbolism and efficiency which all leads to a greater chance of business survival. Lastly the image explains that if one conducts pre-startup planning it can lead to operational efficiency which again leads to business survival.

With these propositions Castogiovanni breaks down what pre-startup planning will do and how it will affect a new or young business.

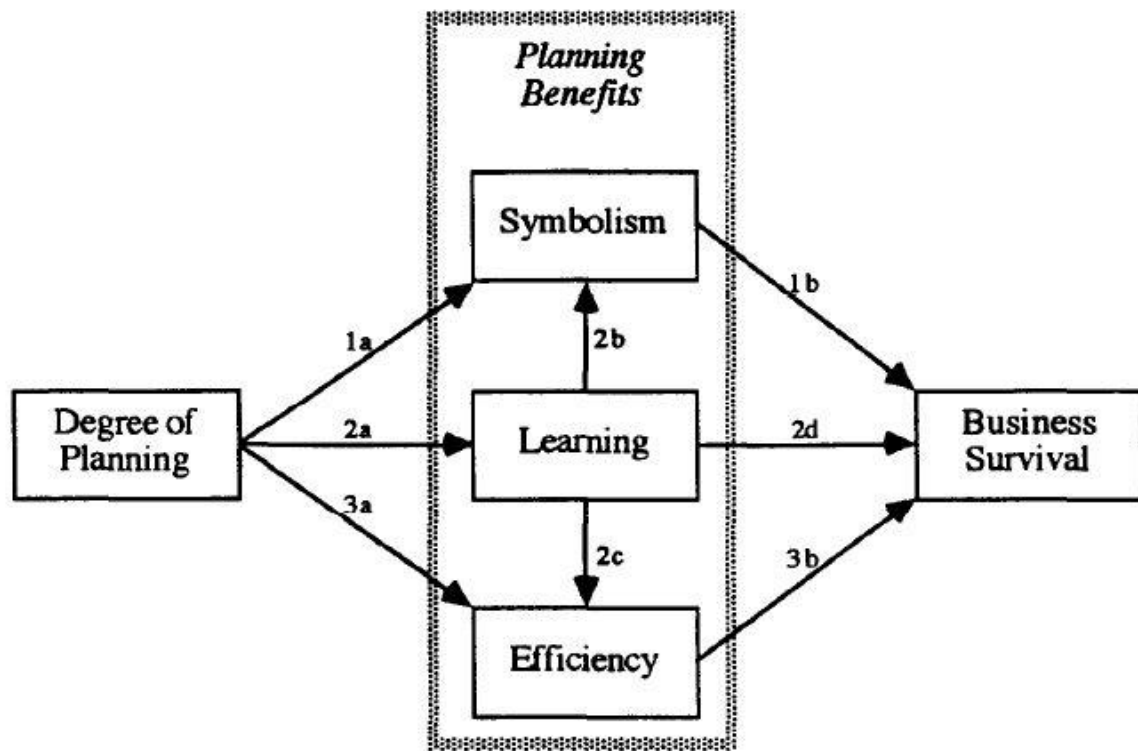


Figure 2: Benefits of Pre-Startup Planning (Castrogiovanni, 1996, p. 807)

Castrogiovanni then goes on to state that there are contextual conditions as well, he calls them environmental conditions and founding conditions and he states how these affect the degree of planning, the planning benefits like symbolism, learning, and efficiency, and business survival.

But no matter when the planning is done, there is much debate regarding when it is helpful and in which context it is helpful in (Castrogiovanni, 1996).

Delmar and Shane (2003) have also looked into whether planning helps a new venture become successful: *“We examine the effect of business planning on three aspects of new venture development: product development, [...], venture organizing activity, [...], and disbanding.”* (2003, p. 1165)

They define three advantages for people who are attempting to start and improve their new business if they partake in planning:

1 *“Planning facilitates faster decision making by identifying missing information without first requiring the commitment of resources (Delmar & Shane, 2003, p. 1167).”*

By planning ahead an entrepreneur will be able to make a quick decision when an event occurs because he or she will have all the facts available instead of making the decision by using “trial-and-error” (Delmar & Shane, 2003).

2. *“Planning provides tools for managing the supply and demand of resources in a manner that avoids time-consuming bottlenecks (Delmar & Shane, 2003, p. 1167).”*

If an entrepreneur plans ahead he or she will be able to see where their resources are going to as well as plan for what future resources will be spent on so that there will not be a hold-up once the resource is acquired.

3 *“Planning identifies action steps to achieve broader goals in a timely manner (Delmar & Shane, 2003, p. 1167).”*

Because of the usually short time between when an entrepreneur of a new venture makes a plan and when it is executed it is easier to see that the plans and goals made were successful, and when the plans and goals are successful it helps the entrepreneur continue onto their next plans and goals (Delmar & Shane, 2003).

Hypotheses	Description	Conclusion
Hypothesis 1	Business planning reduces the hazards of new venture disbanding	Supported
Hypothesis 2	Business planning facilitates product development in new ventures	Supported
Hypothesis 3	Business planning facilitates venture-organizing activity in new ventures	Supported

Table 2: Hypotheses as defined by Delmar and Shane (2003)

From the above statements and what other researchers at that time concluded, Delmar and Shane (2003) produced 3 hypotheses as listed in Table 2.

As a continuation of their research they completed a longitudinal study of 223 new ventures that were established in Sweden in 1998. They went to great lengths to make sure that their sample was completely random. To test their hypotheses they completed a series of statistical analysis and they came up with a few implications. As implications for practitioners Delmar and Shane (2003, p. 1182) writes:

*“The results show that firm founders will enhance the likelihood of their new venture’s survival and facilitate product development and venture organizing efforts if they engage in business planning.”*

From this statement it is understood that in general Delmar and Shane supports the notion that an entrepreneur should partake in business planning before they attempt to start a new business venture.

In 2006 Liao and Gartner published a paper where they are trying to determine when certain entrepreneurs should plan. They differentiate between entrepreneurs who are confident that they have control in certain areas versus those who are not. The three areas they focus on are financial certainty, competitive uncertainty, and operational certainty, as defined by Liao and Gartner (2006, pp. 25-26):

*“Financial uncertainty describes the nascent entrepreneur’s perceptions of the likelihood of obtaining start-up and working capital, bank loans and investors.”*

*“Competitive uncertainty involves the nascent entrepreneur’s perception of environmental factors that affect the strategic viability of the new firm: such as the likelihood the emerging firm will attract customers, successfully compete with other firms, keep up with technological advances in the industry, and comply with government regulations.”*

*“Operational uncertainty involves the nascent entrepreneur’s perception of the likelihood the emerging venture can be efficient in such activities as: obtaining raw materials, attracting employees, and obtaining supplies.”*

Taking these definitions into account and examining authors like Delmar and Shane (2003), Shane and Delmar (2004), Honig and Karlsson (2004), and Castrogiovanni (1996) Liao and Gartner (2006) come up with several hypotheses to test, these hypotheses are listed in Table 3.

These hypotheses are basically saying that if the entrepreneur’s venture is safe, and by safe it is meant that there are what Liao and Gartner (2006) calls environmental certainty, it is better to not plan, or at least, plan late. However, if the venture is not safe it is better to plan early. To test these hypotheses they did statistical analysis of 276 entrepreneurs who either had an operating business, was a part of an active or inactive start-up, or who no longer worked on their start-up. It seemed that Liao and Gartner (2006) found support for their first and second hypotheses and that the third, operational certainty, didn’t seem to affect emerging ventures either way. They found no support for their fourth hypothesis.

Hypotheses	Description	Conclusion
Hypothesis 1a	Planning early in situations of perceived high financial uncertainty is likely to increase the likelihood of new venture persistence	Confirmed
Hypothesis 1b	Planning late in situations of perceived financial certainty is likely to increase the likelihood of new venture persistence	Confirmed
Hypothesis 2a	Planning early in situations of perceived high competitive uncertainty is likely to increase the likelihood of new venture persistence	Confirmed
Hypothesis 2b	Planning late in situations of perceived competitive certainty is likely to increase the likelihood of new venture persistence	Confirmed
Hypothesis 3a	Planning early in situations of perceived high operational uncertainty is likely to increase the likelihood of new venture persistence	Not Confirmed
Hypothesis 3b	Planning late in situations of perceived operational certainty is likely to increase the likelihood of new venture persistence	Not Confirmed
Hypothesis 4	The absence of planning in situations of perceived environmental certainty (financial, competitive, and operational) is likely to increase the likelihood of new venture persistence	Not Confirmed

Table 3: Hypotheses as defined by Liao and Gartner (2006)

So, Liao and Gartner (2006, p. 36) writes: *“It is better, in general, to complete a business plan during the process of venture creation, than to not plan.”* This is generally true, they wrote, however, it depends on the financial situation the entrepreneur is currently in and the amount of competition there is in the market. If there is a high uncertainty when it comes the finances, it is better to plan early, but if the financial situation is quite certain it is better to plan a little later, and if there is high certainty of competition it is better to plan early, while if there is hardly any proof that there will be much competition it is more pertinent to plan later (Liao & Gartner, 2006). As a conclusion they write:

*“Engaging in pre-venture planning would likely increase nascent entrepreneur’s knowledge, and thereby reduce uncertainty. In contrast, for those nascent entrepreneurs who were confident about their knowledge of their competitive and financial situation, engaging in pre-venture business planning would be perceived as a way to enhance knowledge they already have. Planning for these entrepreneurs would be less relevant to their business formation activities early on their venture creation efforts. Yet, as the emerging venture develops, nascent entrepreneur do plan (i.e., late planning) which increases the chances the emerging venture will persist.”*

(Liao & Gartner, 2006, p. 38)

By this statement Liao and Gartner (2006) is saying that all entrepreneurs should plan, it just depends on when planning is needed. Even in later stages planning is needed to be able to

continue keeping ahead. At certain times the business plan or business model will need to be updated to be able to successfully keep up with the market (Aspara, Lamberg, Laukia, & Tikkanen, 2011).

Further supporting the planning side is a 2010 article by Jan Brinckmann, Dietmar Grichnik, and Diana Kapsa, it is called “*Should entrepreneurs plan or just storm the castle? A meta-analysis on contextual factors impacting the business planning-performance relationship in small firms*”. The article’s authors especially wanted to focus on the planning-performance relationship. By ‘planning-performance relationship’ they mean to figure out how planning affects performance in new small firms. Looking at previous works and taking into account the two different schools of thought they define 4 hypotheses as listed in Table 4.

Hypotheses	Description	Conclusion
Hypothesis 1	Business planning in small firms increases performance	Confirmed
Hypothesis 2	Business planning increases performance more in established small firms than it does in new small firms	Confirmed
Hypothesis 3	The outcome of business planning has a greater effect on firm performance than the business planning process	Rejected
Hypothesis 4	Business planning has a greater effect on firm performance in cultures with low uncertainty avoidance than it does in cultures with high uncertainty avoidance	Supported

Table 4: Hypotheses as defined by Brinckmann et al. (2010)

To continue their research they decided to test their hypotheses by using a meta-analysis. After an extensive search of current literature they ended up with 47 studies that contained data for 52 different new and established firms. They compared these firms using these measures: Performance, which measures growth, profitability, and survival; Business Planning, which measured whether the firms were concerned with assessing either the outcome of business planning or the process of business planning; Newness, they defined firms being younger than 8 years as ‘new firms’ and firms that were older than 8 years were defined as ‘established firms’; Cultural uncertainty avoidance, to measure this they applied the uncertainty avoidance index (UAI) that was developed by Hofstede and Hofstede (2005); and Controls, they controlled for when the sources used different factors such as survival versus growth or profitability measures, objective or subjective performance measures, and whether the studies were longitudinal or cross-sectional. By completing several different statistical measures they were able to answer some of their hypothesis as shown in Table 4. As a conclusion they found support for hypothesis one, two, and four, but not for three. They state “*Our findings determine a positive relationship between business planning and*



*performance.*” (Brinckmann et al., 2010, p. 35) They also conclude that there is more value in planning for the average small firm than for the new small firm basically because new firms lack experience and routines that makes planning more constructive.

These publications all support some sort of planning before an entrepreneur starts on a new venture, however, none of them are able to say with 100% certainty that it was because of the planning that certain ventures survive or excel. The follow section discusses articles that find themselves on the other side of the debate and provide good evidence that new ventures should not partake in much planning or plan in a less predictive way.

### **2.1.2 “Storm the Castle”**

Perhaps it would be wrong to suggest to entrepreneurs to not do any planning, but it is important for them to know the significance and importance of the planning. This of course depends on the characteristics of the entrepreneur and the business he or she is trying to start. Especially in smaller ventures where it is difficult for much planning to take place because of the limited financial situation these ventures are usually in, Bhidé (2000, p. 198) writes:

*“Small businesses cannot cover significant upfront research planning expenditures. High uncertainty limits the value of prior planning. In lieu of prior planning and research, the founders of promising start-ups rely on their capacity to adapt to unforeseen problems and opportunities”*

According to Fernandez-Guerrero, Revuelto-Taboada, and Simon-Moya (2012) the business plan quality (when considering economic, financial, and commercial viability) does not indicate whether a new start-up will survive or not. Honig and Karlsson (2004) paper hypothesizes that if companies write and have business plans, they have a higher probability of survival and they are more likely to reach profitability (Table 5 - hypothesis 4 and 5).

However, they found no support for hypothesis 4 and hypothesis 5 was rejected. Honig and Karlsson (2004, p. 43) concludes that: *“It appears that new organizations do not write business plans to improve performance, rather, they do so in order to conform to institutional rules and to mimic the behavior of others”*.

Hypotheses	Description	Conclusion
Hypothesis 1	Nascent organizations whose founders contact public support agencies have a greater propensity to produce business plans than those without such contact	Upheld
Hypothesis 2	Nascent organizations in industries where business planning is deeply rooted have a greater propensity to produce business plans than those in other industrial fields	Upheld
Hypothesis 3	Nascent organizations whose founders have a business education have a greater propensity to produce business plans than those whose founders do not have a business education	Rejected
Hypothesis 4	Producing business plans will increase the probability of nascent organization's survival	Not supported
Hypothesis 5	Producing business plans is positively correlated with the probability of a nascent organization's reaching profitability	Rejected

Table 5: Hypotheses as defined by Honig and Karlsson (2004)

Many times a business plan is only written to help with getting funding, but there might be a better way for public agencies or venture capitalists to measure the quality of the business idea or the entrepreneur (Fernandez-Guerrero et al., 2012). Fernandez-Guerrero et al. (2012) say venture capitalists should look into the experience and education of the entrepreneur, his or her motivation to start the business, and also the number of employees a new business has. By examining these categories public agencies and venture capitalists might get a better idea of whether the business will survive or not and if it is a viable idea to invest in (Fernandez-Guerrero et al., 2012).

These articles do not advise entrepreneurs to not plan during their venture, they are only trying to make sure people know that planning is not always related to positive effects and that different research conclude different findings. However, the definition of what planning is might be different to different entrepreneurs. There are many reasons why companies and entrepreneurs do partake in planning, whether it is predictive planning, or non-predictive planning, either way there are many positive and negative sides to planning. In Table 6, Vesper has listed the Pros and Cons of Planning (1993, pp. 25-26).

As mentioned, some of the reasons why planning is good or bad is in Table 6, however, there are other reasons as well and researchers will continue to look for them in the future.

The theory of effectuation is a form of planning that has a high emphasis on control and a low emphasis on prediction (Wiltbank et al., 2006). This theory of effectuation is the basis of the transformative category and the bottom right quadrant of Figure 1.

In the next chapter a detailed description of effectuation and causation will be given to let the readers understand what we base our research on.

<b>Pros of Planning</b>	<b>Cons of Planning</b>
To test all or pieces of the venture concept and make “go/no go” decisions about them	Time cost of gathering more information, rather than reprocessing what is already known, and of having to redo the plan as conditions change and new information makes old obsolete
To find ways of refining aspects of the product or service and the start-up process so they work better	Danger of reinforcing misleading fantasies about how things will develop, thereby producing poor decisions
To look for ways to improve upon the design goals and concept of the venture itself	Risk of becoming discouraged by envisioning so many complexities that it all seems impossible
To look for other venture opportunities	Drugery of abstract activity with no-real world feedback or results until action is taken
To anticipate needs that may require advance preparatory time	Discouragement from review by others who are better equipped to discover weaknesses than to add reinforcements and reveal directions for further opportunity
To anticipate and head off potential problems in the start-up	Pain of being wrong, a likely experience in planning
To prethink future decisions so they can be made faster and better later	
To get started on long lead time parts of the task in a timely fashion	
To get the benefit of others’ thinking	
To reach a common understanding of cooperative tasks	
To learn about venturing by thinking through what may be involved in it	

Table 6: Pros and Cons of Planning as written by Vesper (1993, pp. 25-26)

## 2.2 Effectuation and Causation

Effectuation and causation belong to a terminology known by the authors of this thesis from the work of Saras D. Sarasvathy. Her work is our main source of information in this chapter. Effectuation is the result of Sarasvathy and others looking into what makes entrepreneurs entrepreneurial ([www.effectuation.org](http://www.effectuation.org)). Sarasvathy found through interviewing 27 entrepreneurs with repeated high success (‘expert entrepreneurs’) that they used effectuation as a method when starting ventures (S. Sarasvathy, 2008, pp. 22,48). This chapter will initially start with a definition of both effectuation and causation, then we will try to explain this terminology in a simple way with the form of a short story, and lastly we dive into those details which will become important for the rest of this thesis.

In the article *“Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency”* Sarasvathy defines causation and effectuation as the following:

*“Causation processes take a particular effect as given and focus on selecting between means to create that effect. Effectuation processes take a set of means as given and focus on selecting between possible effects than can be created with that set of means (2001, p. 245).”*

This is shown in Figure 3. Here you can see how the left side represents causation; the focus is on achieving a wanted goal through a set of means. Since the goal is set pre-start of a venture, the *“search and select”* process which causation is will be a static one (Read, Sarasvathy, Dew, Wiltbank, & Ohlsson, 2011, pp. 6-7). While effectuation on the right side of the figure is testing different effects from the set of means, this is more of a dynamic process.

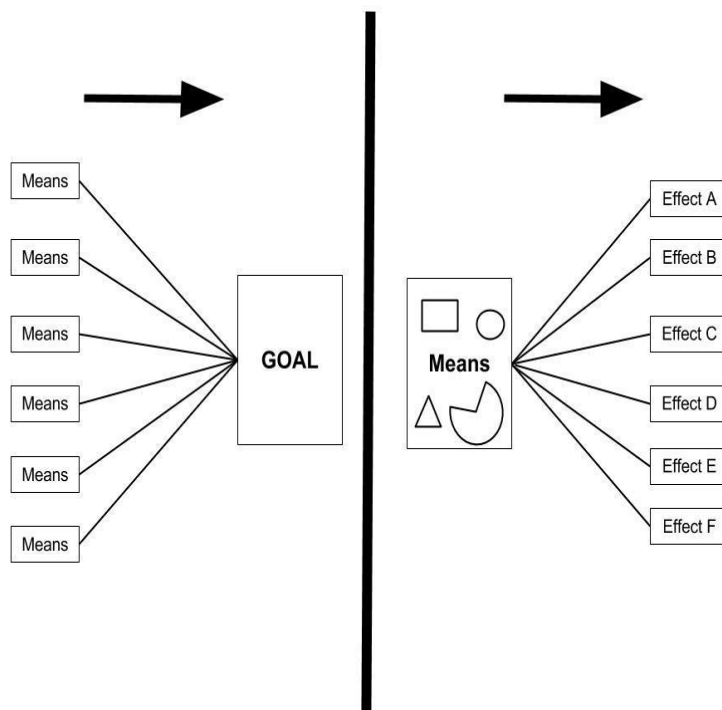


Figure 3: Causation on the left, effectuation on the right (S. D. Sarasvathy, 2001).

The short story is made as a practical example trying to simplify both causation and effectuation. The short story is inspired by Sarasvathy’s story *“Curry in a Hurry”* from her article *“Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency”* (2001).

### **2.2.1 The short story**

Imagine yourself as a painter. You are hired to paint a picture of a couple. They know exactly what they want, and you know what they want. You go out and buy your needed colors and equipment and eventually you finish the picture as ordered by your customers. This would be causation. The well planned result, and the planned for effect.

However, acting within effectuation you would start in a different way. First of all you would not have any clear plan for how the outcome would become. You would look in your cupboards to see what kind of colors you already have, and you would start with a blank canvas, not knowing the exact outcome of what you just started. Eventually you will come up with a result. To take this even further - when making inquiries with other painters, you discover how you are really good at throwing the best art viewings. So instead of finishing your painting, you rather end up running your own 'showings' for local painters. You chose one effect out of several different effects.

As this story tries to emphasize, effectuation is the process where you have a set of means and then you focus on choosing between different effects that can be created from your means. While causation on the other hand takes the effect as given, and is focusing on choosing between different means to be able to create that exact effect (S. D. Sarasvathy, 2001).

### **2.2.2 Predictions about something non-existent**

When starting a business today, in our time of decreasing regulation and planned economies, there is a great chance of not actually knowing precisely what you will end up creating (S. D. Sarasvathy, 2001). Sarasvathy exemplifies four questions barley discussed in management and economic curricula:

*“How do we make the pricing decision when the firm does not yet exist?”*

*“How do we hire someone for an organization that does not yet exist?”*

*“How do we value firms in an industry that did not exist five years ago and is barely forming in the present?”*

*“At the macro level, how do we create a capitalist economy from a formerly communist one?”*

(2001, p. 244)

Sarasvathy further informs us how each of these questions involves the problem of choosing particular effects that may or may not implement intentional goals. She further states:

*“...if we knew precisely what type of firm we wished to create, we could use existing theories and principles to create the firm. But usually all the entrepreneur knows when he or she starts out is something very general, such as the desire to make lots of money or to create a valuable legacy like a lasting institution, or, more common, to simply pursue an interesting idea that seems worth pursuing (2001, p. 244).”*

In effectuation you have more an idea of ‘creating something’ instead of ‘creating that thing’ (S. D. Sarasvathy, 2001). This leads us to the next chapter, how effectual entrepreneurs take sufficient control with the use of the different concepts of effectuation.

### **2.2.3 Concepts of Effectuation and Causation**

When acting out effectuation you are working with five concepts that is part of the effectual cycle. In Table 7 we are presenting these concepts, and also what the contradictory causal view is on each of these concepts.

Read et al. (2011) explains further how the Bird-in-Hand principle works. In effectuation theory it is not necessary to start out with the perfect idea. The idea will become a result of you, as an entrepreneur, actually starting it up. Examples of means, ‘What I have’ or the resource pool, consists of traits, abilities and attributes of the entrepreneur, whom the entrepreneur knows, his or her education, his or her social network, and so on. Knowing this, the entrepreneur can ask him or herself “What kind of effects can I create from this?” The entrepreneur looks to several courses of action and the consequences of these courses will be uncertain (Read et al., 2011, pp. 72-74).

Here we can find a connection to what we earlier found in the work of Fernandez-Guerrero et al (2012) after stating that a business plan is only something the entrepreneur creates in regard to getting hold of funding, they looked for better ways for government organizations and venture capitalist to measure the quality of an idea or an entrepreneur. Government agencies or venture capitalists should look into the entrepreneur's experience, education, motivation and so on, here we make a connection to how government organizations and venture capitalists should look into the means of the entrepreneur (2012).

<b>Concept</b>	<b>Effectuation</b>	<b>Causation</b>
<b><i>“Bird in hand vs. Pre-set goals or opportunities”</i></b>	<ul style="list-style-type: none"> <li>-There are three types of means: Who I am, what I know and whom I know.</li> <li>-The entrepreneur can imagine possibilities from these means.</li> </ul>	-In causation you are choosing between/gathering different means after a goal is set.
<b><i>“Affordable loss vs. Expected return”</i></b>	<ul style="list-style-type: none"> <li>-The affordable loss is how entrepreneurs understand what they can afford losing at each step on the way.</li> <li>-The entrepreneurs are not doing “all or nothing bets”, they rather choose options where there will be an upside even if there is a downside happening.</li> </ul>	-In causation you look at the expected return and to minimize risk from this target.
<b><i>“Lemonade vs Avoiding surprises”</i></b>	<ul style="list-style-type: none"> <li>-Expert entrepreneurs look at surprises rather as new opportunities than a showstopper. The contingency may be a clue to create a new market.</li> <li>-As a result expert entrepreneurs invite surprises, instead of setting up “what if” settings for worst case scenarios.</li> </ul>	-In causation you look at surprise events as something to minimize the risk of.
<b><i>“Patchwork quilt vs. Competitive analysis”</i></b>	<ul style="list-style-type: none"> <li>-Expert entrepreneurs are early on building partnerships with self-selecting stakeholders. They are trying to get pre commitments and partners early on in the ventures life.</li> <li>-Reduces uncertainty and interested partners will co create a new market.</li> </ul>	-You look at other players rather as competition than partners.
<b><i>“Pilot-in-the-plane vs. Inevitable trends”</i></b>	<ul style="list-style-type: none"> <li>-The future is made. Not found, nor predicted.</li> <li>-Focusing on activities within their control, expert entrepreneurs know their actions will result in the desired outcome.</li> <li>-In effectuation, the entrepreneurs have sufficient control. Not full control. This to be able to move ahead and take another step (Read et al., 2011, p. 175).</li> </ul>	-In causation you rely on the market forces to reveal the future.

Table 7: Adapted from *What is effectuation?* (www.effectuation.org, 2011)

Sarasvathy writes in her article called *“The Affordable Loss Principle”* (2006) how the Affordable Loss shows how the entrepreneur estimates the downside to figure out how much the entrepreneur is willing to lose in the process of starting a venture. In this process the entrepreneur is building relationships and brings other stakeholders on board to get hold of and leverage resources. At every choice there is created another option in the future (Saras D. Sarasvathy, 2006).

The Affordable Loss varies from entrepreneur to entrepreneur, and is all about ‘where in life’ and in what ‘environment’ the entrepreneur is at. It does not depend that much on the business

itself. Affordable loss is therefore an estimate for the entrepreneur on which venture to start up. Entrepreneurs using the effectuation method do not need to use other predictions than the affordable loss in itself. If we look back at the questions Sarasvathy (2001, p. 244) asked, we see a set of predictions about the future to be made. This is not necessary when calculating the Affordable Loss, all you need is your own financial situation and your own psychological commitment to a worst case scenario (Saras D. Sarasvathy, 2006)

The 'plunge decision' is the moment when an entrepreneur decides to start up and gives a good example on the Affordable Loss principle. In the school of effectuation the plunge decision would mean you would ask yourself: 'How much am I willing to lose to start up this venture?' Then you may answer: 'I have X amount of money that I can put up, and I have the opportunity to go back to the job market in the next five years.' In contrast the causational entrepreneur would answer: 'I need to raise Y amount of money to start this company, then I am dependent on breaking even at time Z.' It is important to notice how the effectuator is making decisions based upon known facts within his or her control. On the other hand, the causational entrepreneur is making predictions about the future, and which is outside the control of the entrepreneur. There is no rule against effectual and causational entrepreneurs working together, when the effectuator is looking for stakeholders he or she might end up with someone willing to make a commitment which is working out of the causation method (Saras D. Sarasvathy, 2006).

The Lemonade principle is where the effectual entrepreneur leverages surprises, in effectuation theory simply stated as the famous saying 'When life gives you lemons, make lemonade.' In the real world of an entrepreneur a pre made plan leads you away from surprises and helps you overcome or coexist with them. If this is what the entrepreneur is doing, then he or she is missing out on one of the key elements in effectuation - the upside opportunity by surprises, that even negative surprises may give you. In effectuation, surprises are looked upon as a resource in the creation of ventures. A surprise, or a contingency, is things that may or may not occur. There is no logical necessity for them to actually happen. Surprises can happen without a specific known cause. Surprises play an important role in shaping most individuals' means, and the entrepreneur should consider how he or she can alter these (Read et al., 2011, pp. 140-145).

Henry et al. wrote how the 'gut feeling' or the 'art' of entrepreneurship is not teachable (2005b). We see how a connection to effectuation can be made. We see how the Lemonade



principle in effectuation gives more room for doing the art and using those gut feelings. How you leverage contingency can be looked upon as creative room in entrepreneurship.

The authors of this thesis see yet again how effectuation is a circular process. Lemons or a surprise, in the form of information, people, events, or the like, will again become an asset in the entrepreneurs pool of resources, namely his or her means (may also add to goals) which is the beginning of the effectual process.

#### *A map of how it works*

Figure 4 shows the cycle of effectuation. The process starts with the entrepreneur assessing his or her means and is moving towards setting goals. When eventually the entrepreneur has made inquiries and is making pre-commitments, the process becomes circular. You get new means, new goals, or both. Meanwhile, surprises or Lemons add to both the means and goals.

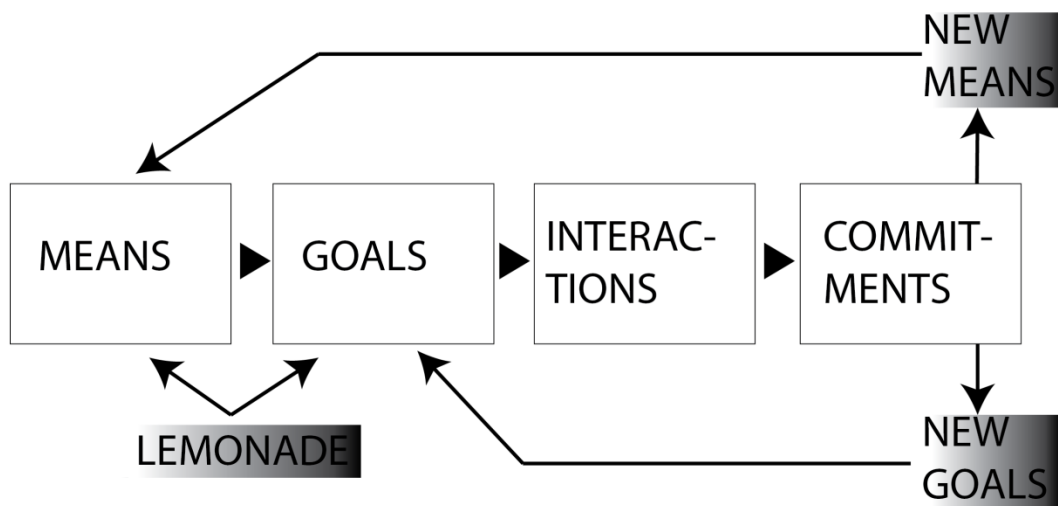


Figure 4: The process of effectuation (www.effectuation.org, 2011)

#### **2.2.4 Effectuation is a method**

Sarasvathy informs us in her book *“Effectuation, Elements of Entrepreneurial Expertise”* how entrepreneurship should be looked upon as a method, just as the scientific method is a method (2008). Sarasvathy states *“...an effectual logic fuels the entrepreneurial method, just as the scientific method operates through the logic of experimentation”* (S. Sarasvathy, 2008, p. 308). This means that effectuation is something that can be taught, and is not something mystical that some people have access to and others not (2008).

Many researchers discussed in this thesis (Brinkmann et. al, 2010; Honig 2004; Delmar 2003) mention the questions regarding the teachings of entrepreneurship.

## **2.3 Can entrepreneurship be taught?**

There is an ongoing discussion in the entrepreneurship academy whether or not entrepreneurship can be taught (Fiet (2001a, 2001b); (Henry, Hill, & Leitch, 2005a; Henry et al., 2005b); Béchard and Grégoire (2005)). The literature regarding what should be taught in programs and lectures are extremely well covered by academics throughout the world. However, not many have done research on the topic of whether or not entrepreneurship actually is taught. It is clear that the interest for entrepreneurship from an educational perspective has grown tremendously since the 70s. According to Fiet (2001a) in 1971 there were only 16 colleges and universities in the United States that taught entrepreneurship, and by 2001 there were over 800 colleges and universities in the United States that had entrepreneurship classes, programs, and initiatives.

It is said that entrepreneurship can be divided into two by separating the art of entrepreneurship from the science of entrepreneurship. The science of entrepreneurship can be defined as *“the business and management functions”* (Henry et al., 2005b). In a classroom situation, the topics that would cover the science of entrepreneurship would be writing a business plan, researching the market, writing a financial plan, creating a strategy plan, and learning how to present business plans. These topics are teachable (Henry et al., 2005b) and are often taught by introducing students to theories and previous research. These topics also represent the principles of causation. However, when looking at the art of entrepreneurship it can be defined as *“the creative and innovative attributes of entrepreneurship”* (Henry et al., 2005b, p. 164), this part of entrepreneurship seems to be non-teachable (Henry et al., 2005b). The artistic part of entrepreneurship is more challenging to define in the classroom because of its nature. The art of entrepreneurship includes what is considered ‘the gut feeling’ as well as how a person behaves as an entrepreneur, and it answers the question: What sets an entrepreneur apart from other people? Even though it is difficult to teach the art of entrepreneurship, according to Henry (Henry et al., 2005b, p. 165): *“most commentators believe that at least some elements associated with the subject can be developed and enhanced via education and training”*. It is difficult for entrepreneurial teachers to teach entrepreneurial students what they know, because they probably learned most of it through

experience as Timmons and Stevenson (1984) suggests, as written in Henry et al. (2005a, p. 104): *“There is a limit to what can be taught in entrepreneurship training programmes, and the only way to learn is through one’s own experience.”* Also Fiet (2001b, p. 10) says something to the same effect: *“A theoretical teaching has limited usefulness as a guide for instructing aspiring entrepreneurs about their prospects for future success.”* He also goes on to state that: *“The objective of entrepreneurship theory is to help entrepreneurs to understand the consequences of their decision.”* Fiet (2001b, p. 11) However, the effectuation cycle may provide a framework for approaching and incorporating the art of entrepreneurship. The logic of affordable loss and surprises as opportunities could show students how and when to make gut decisions and creative solutions to go around barriers.

From these statements it is difficult to conclude whether or not entrepreneurship can be taught as there is research supporting both side of the debate. However, it was availed that a common belief is that the science of entrepreneurship can be taught, but the art of entrepreneurship is more difficult to teach.

## **2.4 Theory Conclusion**

The discussion within the literature shows debates on entrepreneurial planning, different planning logics, and entrepreneurship education. Along with these opening remarks we want to make sure it is understood that we do not look upon causation as “planning” and effectuation as “not planning”. Both causation and effectuation are planning methods. The difference is if it is predictive or non-predictive planning.

As shown in the previous section at least some parts of entrepreneurship can be taught. Which is a good thing as the authors of this paper are three master students who are about to finish a program of Innovation and Entrepreneurship, for us it is interesting to learn if entrepreneurs do as we have been taught. As described in detail in earlier sections the debate of how and when to plan is ongoing and detail research has been done on the subject and on the theories within entrepreneurship. However, we were unable to find current research on whether students in an entrepreneurship program actually learn methods of thinking and performing that are similar to what real entrepreneurs think and do.

# 3 Methodology

The newness of effectuation and causation theory, particularly as it applies to non-expert entrepreneurs and students, compels the inductive approach of exploratory research. Further, the entrepreneurship teach-ability debate deserves a comparative look between entrepreneurship students and practicing entrepreneurs. Wilson states exploratory research is viable “*where there currently exists very little, if any, earlier work to refer to* (2010, p. 103).” Investigation of the entrepreneurial participants’ perceived process of business venturing further warrants a subjectivists ontology and interpretivism epistemology (Wilson 2010: 10 - 12). In light of these methodological considerations and interest across different types of entrepreneurs as they measure up to one another, an *exploratory approach of multiple cases* using replication logic and cross-case analysis is viewed to be appropriate.

## 3.1 Research design

*Multiple case design* was followed as a means to answer our research question. The state of the literature on non-expert entrepreneurs and entrepreneurship students is an opportunity to further research the extent of effectuation theory beyond expert entrepreneurs, as defined by S. Sarasvathy (2008, p. 21). Case study design is justifiable when studying complex systems occurring in daily life (K. Yin, 2009, p. 4). Use of multiple cases is similar to performing several experiments to investigate and elicit intra- and inter-group similarities and differences (K. Yin, 2009, p. 54). Additionally, use of several cases often increases the robustness of a study’s results when compelling and appropriate implementation of multiple case study design is achieved (K. Yin, 2009, p. 53). Researching entrepreneurship students and two types of entrepreneurs through an effectuation theory framework represents theoretical replication and warrants multi-case research design.

In this study we were interested in three distinct groups: Experts, Entrepreneurs, and Students (all defined in 3.1.3: Choice of Cases). Implementing multiple case design, we are able to use both replication logic through explanation building prototypes of Experts, Entrepreneurs, and Students; and, cross-case synthesis to bring greater context to our research question. The approach allows for a valid analysis of how these three groups differ from or are similar to one another in relation to various aspects of effectuation and causation processes.

Figure 5 illustrates the four stages of the research process. The jumping off point presented itself after interviewing young technology based startups' CEOs and discussions with our supervisor. The stages clarified the steps needed to complete our research in setting up a research calendar. The research design process was based on our research question, the phenomenon investigated, and available resources. Propositions and theoretical implications are discussed in the Discussion chapter.

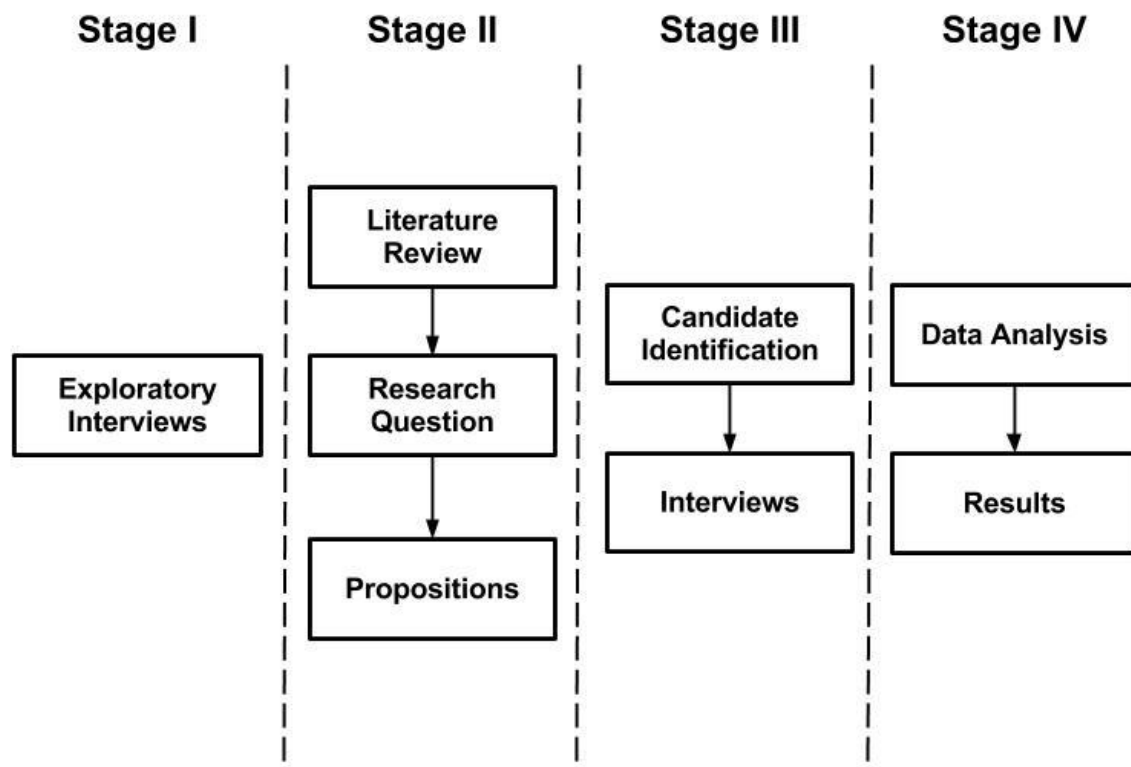


Figure 5: Research Stages

### 3.1.1 Research question

Based on the continuing debate laid out in chapter 2, the Theory chapter, there is much to investigate in selecting an entrepreneurial process and its impact on the success of the venture. An important note to make is that these processes were delineated from researchers' observations of entrepreneurs and may not be consciously practiced.

Additionally, effectuation theory offers a new perspective on the process of entrepreneurial venturing. Though, few have applied the theory in research, particularly when making comparisons between students and entrepreneurs.

Further, educational programs intrinsically endorse the idea entrepreneurship is teachable offering courses and whole programs on the subject. The United States has seen university programs offering entrepreneurship grow by a factor of 50 in the last thirty years of the twentieth century (Fiet, 2001a). The result has been an increasing number of business programs with varying degrees of entrepreneurial focus on the two competing schools of thought – the ‘planning’ versus ‘storm the castle’ mentalities. These programs aim to educate aspiring practitioners similar to professional studies with known methodical processes. However, the current literature bares little research on entrepreneurship study programs and their overlap with practicing entrepreneurs.

Exploratory interviews with CEOs of young technology based startups, the continuing debate in the literature on venturing processes, and our experience as entrepreneurship students inspired the following research question: *How do entrepreneurship students’ perceptions on venturing, in the context of causation and effectuation, compare to experts and entrepreneurs’ perceived paths to success?*

### **3.1.2 Research Strategy**

According to Yin, multiple case studies are appropriate when employing replication logic to the study (K. Yin, 2009, p. 54). Replication logic in multiple case studies dictates both attempts at exact replication and slight alterations of the original study to test robustness (K. Yin, 2009, p. 54). Yin further asserts (emphasis added):

*The ability to conduct 6 or 10 case studies, arranged effectively within a multiple-case design, is analogous to the ability to conduct 6 to 10 experiments on related topics; a few cases (2 or 3) would be literal replications, whereas a few other cases (4 to 6) might be designed to pursue two different patterns of theoretical replications.*

(2009, p. 54)

Effectuation theory, as described in the chapter 2.2, was developed by S. Sarasvathy (2008) to describe the process she observed from studying expert entrepreneurs. In contrast to the

effectuation process, S. Sarasvathy (2008) classified causation theory as existing practices in management theory. Therefore multiple cases in this research can be used to achieve literal replication (Expert) and two divergent replications (Entrepreneurs and Students). In the context of these two contending theories, our approach is within the scope of an exploratory step away from the literature presented in the chapter 2.2. Due to the time constraints of this thesis and availability of Experts, all interviews were carried out prior to full analysis of the individual cases. However, as part of the research process, we discussed our first impressions from the interviews and ways to improve data collection during the interviews. For example, after interviewing a couple of students, it became clear the hypothetical questions could be vague, so we asked them to think about how they had previously dealt with surprises and other relevant situations. Interview questions can be found in Appendix 1.4.

To strengthen multiple case studies, when a higher degree of certainty is needed or dealing with subtle theory, Yin recommends increasing the number of literal replications. (2009, p. 58) To this end we managed to complete four interviews with Experts, for a total of four literal replications.

### **3.1.3 Choice of cases**

The three groups of interviewees – Experts, Entrepreneurs, and Students – were chosen for the purpose of answering our research question. The groups and the cases were based on the classes of information-oriented selection – key, outlier, and local knowledge cases.

Interviewees considered Experts are based on an adaptation of S. Sarasvathy (2008) definition<sup>1</sup>, due to access and time issues. Rather than using her initial public offering criteria, we determined expert entrepreneurs based on their companies' annual turnover of greater than 10 million Norwegian kroner, positive profits, and a customer base spread around the world. Experts were accessed through our personal network. However, Expert B was initially in the Entrepreneurs group. He was re-categorized as an Expert after the interview. During discussion of Expert B's interview, we realized he fit our Expert definition. Due to the limited research time frame, geography, and the busy schedules of these participants, there were four

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<sup>1</sup> "...a person who, either individually or as part of a team, had founded one or more companies, remained a full-time founder/entrepreneur for 10 years or more, and participated in taking at least one company public (S. Sarasvathy, 2008, p. 21)"

interviewees classified as Experts. One of which was conducted over the phone and another via email of the interview questions. The remaining two interviews were conducted in person.

Selection of Entrepreneurs was based on leaders or founders of companies located at Forskningsparken – a research park in Oslo. Entrepreneurs are defined as those whose companies have reached or surpassed break-even in their operations. The intention is to identify entrepreneurs who have demonstrated some measurable success. Doing so provides contrast to S. Sarasvathy (2008, p. 21) expert entrepreneurs from whom she developed the theory of effectuation. Financial results, publically available from PROFF The Business Finder website<sup>2</sup>, were used to identify companies, leaders, and founders who had reached or surpassed the break-even point in their operations. The most recent year's data at the time of candidate selection (February 15, 2013) was from 2011. The original list of companies included biotechnology, chemicals, IT, geotechnology, and specialty equipment firms. Interview request emails were sent out to all firms on the list. The final interviewees represented IT, chemicals, specialty equipment, and robotics firms.

Five in person interviews were granted of the 24 requests; approximately a 20 percent response rate. Additionally, three Entrepreneurs declined due to a lack of available time, and contact information for two other Entrepreneurs was no longer valid. The response rate is considered reasonable for a short study period and the busy nature of the participants. Firms and Entrepreneurs located at Forskningsparken were selected due to the researcher's close proximity, access to the facilities, and the research park's close alliance to the University of Oslo and internship partnership with students from the Centre for Entrepreneurship. The time constraints of the research also limited the scope to remain focused on a close partner organization.

Five Students were chosen for their enrollment in the Centre for Entrepreneurship master's program for Innovation & Entrepreneurship. The researchers gained access to the Students due to their co-enrollment in the program. Three subjects are in their first year of the program, and two are in the second year. Limited fraternization between the researchers and the first year students helped limit interpersonal relationship bias from injecting itself in the research. This likely limited subject and observer biasing. The two second year students were included

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<sup>2</sup> [www.proff.no](http://www.proff.no)



to increase granular data on the educational outcome between the two years. Increased granularity at the expense of objectivity, so long as granularity provides useful insights for the study, was viewed as worth the cost. However, we attempted to limit biasing providing the same level of information to the second years as with the other participants. Additionally, we kept the threat of biasing in mind during the interviews and worked to keep the same level of distance between all participants and ourselves. The student interviewees were selected based on responses to in person and email requests sent to the students.

### **3.1.4 The unit of analysis**

Multiple holistic analyses: Several cases with one unit of analysis per case (i.e. several individuals' – Experts, Entrepreneurs, and Students – process of venturing are the cases and the unit of analysis)

There were fourteen cases and thus units. Three types of interviewees classified the cases' units: Experts, Entrepreneurs, and Students.

Experts and founders of companies at Forskningsparken (Entrepreneurs) were interviewed about their experience starting and running profitable or break-even ventures. Five students from the University of Oslo master of Innovation & Entrepreneurship program were asked questions adapted from the original questions to account for the hypothetical situation Students face – none of them had founded a startup. The aim was to gain insight into their perspectives of the entrepreneurial process.

Additionally, all interviewees were asked about their previous experiences (including education), and their knowledge about the two competing theories of entrepreneurship processes (causation and effectuation). The participants provided valuable information on intra- and inter-variations of each case type.

### **3.1.5 The quality of research**

Due to the nature of the research question of how different categories of entrepreneurs' views on the venturing processes compare, most data was obtained directly from the research participants during the interviews. Thus, the primary threat to reliability is the use of semi structured interviews as the main source of data. This can result in subject biasing in the

results. However, the intention of the research was to gain the perspective of the interviewees' venturing style and process. To improve reliability, we followed Yin's three principles for data collection: using multiple data sources, creating a case study database, and maintaining a chain of evidence (2009, pp. 114 - 124). Additionally, two case study protocols were developed, one for the Experts and Entrepreneurs, and a second for the Students.

### **Multiple sources**

While semi structured interviews were the primary source of data on the participants, additional data was collected from their firms' websites, PROFF The Business Finder website, and social media pages (i.e. LinkedIn). This data helped triangulate facts from the interviews. However, these secondary sources of data did not provide much verification of the opinions or attitudes of the interviewees. Yin suggests comparing behavioral data with other similar participants (2009, p. 109) Though, multiple cases do not serve as corroborative evidence to counter subject bias, it does improve the robustness through replications across cases and building prototypes of the Experts, Entrepreneurs, and Students.

### **Study database**

All material pertaining to this study was collected in a database. The database includes advisor meeting minutes, interview protocols, list of potential participants, interview recordings, interview transcripts, interview notes, emails with the interview subjects, and secondary data (i.e. profile information from social media and firm websites). The interviewee data was organized by category (Expert, Entrepreneur, and Student). Summations of the participants' answers to our interview questions were made and collected in spreadsheets. Coded data were organized into documents and tables.

### **Chain of evidence**

We took the following steps to establish chain of evidence: the case descriptions, cross-case analyses cite the relevant interviewees thus referencing the case database's coded material; and the case database contains the full collection of raw and coded data, and the data collection circumstances.

## Validity

Fourteen cases and three prototypes were explored and analyzed in relation to effectuation and causation theory, and the research setting. Findings in this study provided insight into the individual cases and prototypes. However, care should be taken in extending the results to a broader setting. The following steps were implemented to improve the validity of the research.

- **Construct:** Prior to beginning data collection, our research question and interview questions went through an iterative process. This included reading relevant literature and review of our interview and research questions by our supervisor. Interviews conducted in Norwegian were translated and then corroborated by the interviewees to confirm accurate translation. We sent the case reports to our interview subjects for review as a means to corroborate the essential facts and evidence presented in their case description, as suggested by Wilson (2010, p. 122). Additionally, use of multiple sources of evidence and establishing a chain of evidence bolster construct validity (Ariño & Ring, 2010)
- **Internal:** For internal validity, our general analytical strategy relied on effectuation and causation theory in guiding the organization and analysis of our case evidence. Our dominant analytical procedures were explanation building and cross-case synthesis. We used the theoretical framework of the five principles in the effectuation and causation processes to build explanations of the different venturing practices and perspectives of our participants. The two processes were used as rival explanations of one another. Further, the same framework of principles was used to build prototypes of the Experts, Entrepreneurs, and Students through cross-case synthesis. Following Eisenhardt (1989) advice, the process permitted us to “...look for within-group similarities coupled with intergroup differences.” We put data in tables for comparison of effectuation and causation principles. From this, the developed prototypes we created effectuation and causation indexes to make inter-prototype comparisons.
- **External:** Creation of prototypes formed the basis for establishing replication conditions.

## **3.2 Research methods**

### **3.2.1 Research setting**

To understand how students' perceptions on the venturing process compares to actual actors in the field, the previously described multiple-case study design was employed. Performing a longitudinal cross-case study of the three groups (Experts, Entrepreneurs, and Students) would have been preferred, but the time was not available for this thesis project.

A snapshot of their perspectives must suffice for this initial study. Thus, interviews to ascertain their current perspectives were the best option. Fourteen cases broken down into four Experts and five cases for both Entrepreneurs and Students is sufficient data to achieve replication according to Yin (2009, p. 54). Twelve of the fourteen participants were interviewed in person, one Expert was interviewed over the phone, and another expert was sent an email with the interview questions. Our promise of anonymity to interviewees was meant to protect their identities and permit them to be more comfortable providing honest answers. The following is a brief introduction to our cases.

#### **Expert A**

Expert A is the Chief Marketing Officer (CMO) at a global corporation that has customers in more than a 100 countries. The firm has offices in 30 countries and approximately 2450 employees worldwide. We conducted a phone interview with Expert A in Norway. Expert A has an engineering degree from England and he has been in the marketing sector most of his career before landing his current position as CMO.

#### **Expert B**

Expert B earned his degree in Biochemistry from the University of Oslo. However he explained to us that he is first of all a merchant. Expert B leads a biotechnology company he helped found in the early 1990s. Since the firm's founding, Expert B has held many leadership roles within and outside the firm. The firm has customers worldwide and provides custom production services. The interview was in person at Expert B's office.

### **Expert C**

Expert C is a software engineer who was educated in China where he was also born and raised. For a long time he worked for a Swedish company in the US. After which he left to start his own IT consultancy company. Expert C has several business ventures in China. Expert C answered the interview questions via email.

### **Expert D**

Expert D completed 2 years of photography educated in Sweden. He worked as a photographer for a large newspaper in Norway before he was promoted to photo editor. Now he is the CEO of his own software company that he started in 1994. The firm has partners and customers all over the world. The interview was held in person at Expert D's office.

### **Entrepreneur A**

Entrepreneur A has a small company founded in 2011. Currently they are two full time employees (the two founders) and one part time employee who helps out with finances a few hours a week. The company serves as an IT consultancy company while the two founders come up with one great idea that they can work with for the rest of their lives. Entrepreneur A has a master's degree in informatics from the University in Oslo and has attended Gründerskolen courses on entrepreneurship. The interview was carried out by two of the researchers at Entrepreneur A's office.

### **Entrepreneur B**

Entrepreneur B is a professor of chemistry and leads a research group at a Norwegian university. He has no formal or informal business training. He started his first company as a way to invoice his services and commercialize technology developed in his research group. The company sells specialty research equipment. The interview was held at Entrepreneur B's office.

### **Entrepreneur C**

Entrepreneur C has his background from automatisisation and cybernetics, he has no formal or informal entrepreneurial training. However, he has started two firms, and is in the process of

starting his third company. The company he now spends his time with is a company which he categorizes as a company working with industry systems. The interview was in person at the office of Entrepreneur C.

### **Entrepreneur D**

Entrepreneur D has a background in IT from University of Oslo, and he has no entrepreneurial training. The company he now works for is the first and only he has started, which he categorizes as a company in the IT industry. Entrepreneur D was interviewed in person at his office.

### **Entrepreneur E**

Entrepreneur E has a background in chemistry and several years experience in the pharmaceutical industry, but has no formal training in business or entrepreneurship. He has started one company, which he classifies as in the chemicals industry. The interview was held at his office.

### **Student A**

Student A has a background in construction engineering at the Oslo University College. Student A started the Innovation and Entrepreneurship program, as he wanted to start up a company. The interview was held in person at UiO's new IFI building where the Centre for Entrepreneurship is housed.

### **Student B**

Student B has a background in computer science and worked for a couple of years in IT consulting prior to joining the Innovation and Entrepreneurship master's program. He is pursuing the master's degree to pivot his career focus away from a purely technical role and to fulfill his ambition of working for himself with innovative technologies. The interview was held in person at UiO's new IFI building where the Centre for Entrepreneurship is housed.

### **Student C**

Student C is a student who has a bachelor in informatics from the University in Oslo. She started the Innovation and Entrepreneurs master program because while she was completing her informatics bachelor she felt that she and her classmates came up with many great ideas and products, but she noticed that most of them weren't able to take the ideas and products to the next level. The interview was held in person at UiO's new IFI building where the Centre for Entrepreneurship is housed.

### **Student D**

Student D has his background as a civil engineer in robotics. He is planning to start up a company, and still is after he has been studying Innovation and Entrepreneurship. He attended the Innovation and Entrepreneurship program due to him believing that Norway is a low-innovation country so the Norwegian government will need to have a huge focus on this program. The interview was held in person at UiO's new IFI building where the Centre for Entrepreneurship is housed.

### **Student E**

Student E's background is in engineering. She is unsure on whether to she wants to start a company; she expressed a preference of working at a startup. Student E wanted to change career track away from a purely technical field, so she joined the University of Oslo's Innovation and Entrepreneurship program. The interview was held in person at UiO's new IFI building where the Centre for Entrepreneurs is housed.

## **3.2.2 Data collection**

To achieve our research goal, we interviewed the three groups on their perspectives of the venturing process. Interviews were deemed the most appropriate approach, as the target groups' perspectives are, by definition, their personal views on a complex process. Further, Crang and Cook (2007) pointed out interviews provide a means for researchers to gain insights into people's complex lives.

The interview questions were developed to answer our research question using effectuation and causation principles as the framework for analysis. The interview questions were also

designed to serve as a base of our semi-structured interviews. This gave room for new ideas and questions during an interview through the free exchange of ideas. By having the question guide, we could explore unexpected information without going too far off track from our research objective. Prior to conducting interviews, the interview questions were shared with our supervisor for approval.

Interview request letters were sent out via email to the identified suitable candidates. The letter requested an interview no longer than an hour and offered anonymity for the participants and their firms. The candidates interviewed replied typically within a week. Nonresponsive candidates were contacted by both a second follow up email and phone call. However, no additional candidates were acquired this way. Student candidates were contacted directly in person and via email.

According to Wilson, interviews conducted in a comfortable and familiar location for the interviewee is ideal (2010, p. 138). On site interviews were held in an attempt to help put the interviewees at ease. The face-to-face interviews were held at the offices of two Experts and the five Entrepreneurs. The Students were interviewed in private at the building that houses the Centre for Entrepreneurship, thus providing a familiar and comfortable setting for the students to speak candidly. All participants were assured of their anonymity prior to starting the interview. Audio recording of the face-to-face interviews were made with the permission of the interviewees. During the interview, notes were made as well. However, priority was given to engaging in a full conversation with the interview subjects.

### **3.3 Data analysis**

The research question informed the analytical approach, while the research design and theoretical lenses guided the coding process. Prior to analysis, the raw data from interview audio recordings, interview notes, and follow up email questions and answers were transcribed. Once fully transcribed, we took steps to familiarize ourselves with and code the data.



### 3.3.1 Coding process

Familiarization with the data involved rereading the transcripts and forming short synopses of the interviewees' answers to the guiding questions of the interviews. The synopses were organized in a spreadsheet according to interviewee and question. This was followed by a review of the synopses and transcripts by the other two researchers.

In order to code the data, we used both priori and emergent coding techniques. The interviews were first coded for the five steps in the effectuation cycle. Second, we coded the interviews by the corresponding five steps in the causation process. In parallel with these two coding events, we tagged interesting statements for discussion with all researchers. An acceptable process given Wilson definition that “[c]oding is simply selecting the elements of your data that you believe are both interesting and relevant to your research (2010, p. 258).” Early in the coding process statements were highlighted for further discussion when we were individually unsure of the correct code. Discussion of some of the highlighted statements led to an emergent category. The statements involved contradictory thinking such as:

*“...its probably much more important to kind of show this business plan to some investors in a way, but personally I want to first establish a company, make it run and then maybe use some more time, make it run and yeah, perhaps have a few people. And then go out and get money if you need it”*

Entrepreneur A

The entrepreneur is demonstrating an effectual tendency, but believes it's better to follow a causal approach. This and similar quotes were coded as *do effectuation/think causation*.

The above quotes demonstrated the need for allowing emergent themes in a coding frame. The familiarization and coding steps enabled the fracturing and organization of the data to analyze the cases. We organized the coded quotes by effectuation and causation principles, and two groups (Experts & Entrepreneurs, and Students). Tables with the ten principles (five effectuation and causation) and emergent themes were made for each participant to better see similarities and differences among them. Indeed, the method provided perspective and insight into each case, which is difficult to obtain from listening to the interviews or reading the transcripts.

### **3.3.2 Analysis strategies and techniques**

Interviewees and their perspective on the venturing process were treated as individual cases for holistic analysis. Developing case descriptions and examining rival explanations were the two general case analysis strategies followed. Yin warns developing case descriptions is a less preferable strategy than using theoretical propositions (2009, p. 131). However, the nature of the research fits better with developing case descriptions to explore effectuation theory beyond Sarasvathy's expert entrepreneurs (2008, p. 21).

Replication logic based on the effectuation and causation processes served as the analytical framework. The two counter processes acted as rival explanations to one another. The Experts were a test of literal replication to Sarasvathy's (2008, p. 21; 2001) effectuation theory, whereas the Entrepreneurs and Students pushed the research into two separate pattern replications.

Further, as a multi-case holistic study, cross-case synthesis is an especially relevant analytical technique (K. Yin, 2009, p. 156). A uniform framework of the effectuation and causation characteristics was developed for both intra- and inter-group cross-case analysis of the three types of entrepreneurs (Expert, Experienced, & Student). The cross-case framework was derived from the coding framework described in the coding subchapter. Additionally, effectuation and causation indices were calculated for each participant as well as the three groups' averages. The index calculations were based on participants' coded use of the principle from effectuation or causation principles. Participants were allocated a point for data supporting their use of each principle. The principles were organized into two axes: effectuation and causation. Averages for each group formed the prototypes. The prototypes were normalized for comparison. The results are plotted in figures at the end of each analysis of the groups.

# 4 Analysis and Interpretations

Case descriptions were developed from the raw data and are presented in Appendix 1.1 and Table 8 through Table 13. The cases were examined through the lenses of effectuation and causation principles during the explanation building process. Intra-group synthesis was used to build the prototypes of Experts, Entrepreneurs, and Students for determining replication. Cross-case analysis of the prototypes was interpreted in developing propositions presented in chapter 5; Discussion.

## 4.1 Interview presentations

In this chapter we present two set of tables. One table for where Experts, Entrepreneurs, and Students showed evidence of effectual behavior and one table where they showed causational behavior. There is written a short explanation or statement where the interviewee showed evidence of a principle. If the interviewee did not show any evidence in that principle, nothing was written. A more complete case description of the interviewees is in the appendix.

### 4.1.1 Experts

As mentioned in the Methodology chapter we interviewed four Experts. In Table 8 and Table 9 an overview is given of which of the principles of effectuation and causation the Experts showed evidence of. Table 8 lists the Effectuation theory's principles while Table 9 lists the Causation theory's principles. Short statements about what the Experts said or did are placed in the box corresponding to the principles in question. Where we did not find evidence of Experts practicing one of the principles, the section was left blank.

<b>Effectuation</b>	<b>Expert A</b>	<b>Expert B</b>	<b>Expert C</b>	<b>Expert D</b>
<b>Bird-in Hand</b>	He used his means to get what he wanted	Expert B was assessing his means when asking people he knew with the needed experience when doing something new	He always uses his network to expand his business and tap into new market and new businesses	Using friends and connections in different places he started his company with funding from his employer
<b>Affordable Loss</b>			Having a plan A and B and only taking the risk he can afford	When Expert D started his company he knew that if he failed he still had a job and an income from his previous company
<b>Lemonade</b>	Making all marketing events something that would benefit his company, even the negative ones			
<b>Patchwork Quilt</b>	He keeps close contact with all the companies they are in contact with	Expert B stated that it is important to find people who has gone through what you are going through before and learn from them	Expert C made his previous employer become his largest customer once he started his new firm	From the beginning they knew they wanted to use partners as a way of selling their software. They got pre-commitments early in the venture from partners wanting to sell their software
<b>Pilot-in-Plane</b>				They focus on activities within their control like changing their goals and activities to fit with reality

Table 8: Expert Effectuation Example Synopses

<b>Causation</b>	<b>Expert A</b>	<b>Expert B</b>	<b>Expert C</b>	<b>Expert D</b>
<b>Pre-set Goals and Opportunities</b>	In a large company such as this there are milestones and goals to work towards and there are plans to follow			Expert D mentioned that as they are getting bigger they are more focused on plans and certain goals
<b>Expected Return</b>		Expert B is concerned about investor relations - we look at this as expected return. Expert B says that risk has been dealt with since the investors has been willing to put in more money	Writing business plans to the best of his knowledge	
<b>Avoiding Surprises</b>	He is always prepared for any question, good or bad	Expert B seems concerned with how a protection to an idea is very important	Thinking 5-10 years ahead	
<b>Competitive Analysis</b>				
<b>Inevitable Trends</b>		Expert B follows the market that is already out there and accepts how things are without trying to change them		

Table 9: Expert Causation Example Synopses

### **4.1.2 Entrepreneurs**

Five Entrepreneurs were interviewed, as introduced in the Methods subchapter. An overview of the five cases is presented in Table 10 and Table 11. The tables are a breakdown of the principles of effectuation and causation theories, respectively, as demonstrated by the Entrepreneurs. The Entrepreneurs showed evidence of both effectuation and causation. Short statements about what the Entrepreneurs said or did are placed in the box corresponding to the principles in question. On the occasions we did not find evidence of an Entrepreneur practicing one of the principles, the section was left blank.

### **4.1.1 Students – Centre for Entrepreneurs, UiO**

As mentioned in the Methodology section we have been able to interview five Students attending the two year Master of Science in Innovation and Entrepreneurship at the University of Oslo. Students A and B were attending their first year in the program, while student C, D and E were in their second year. Full summaries of their case reports are listed in the Appendix. In Table 12 and Table 13 an overview is given of the evidence demonstrating their use of the theories of effectuation and causation. Table 12 lists the Effectuation theory's principles, and Table 13 lists the Causation theory's principles. Short summaries or statements by the Students are placed in the box corresponding to the principles in question. Where we did not find evidence of a Student practicing one of the principles, the section was left blank.

Effectuation	Entrepreneur A	Entrepreneur B	Entrepreneur C	Entrepreneur D	Entrepreneur E
<b>Bird-in Hand</b>	He knew he wanted to work with his current partner because of the chemistry they had together during school	Started company to take advantage of his expertise in his research field and generate income from what he was already doing for free	Entrepreneur C financed his own company of product development by using 50% of his time doing consultancy	The Entrepreneur used means available to him and his prior knowledge to start his company	Entrepreneur E explained he had worked on a technology for some years and decide he wanted try and commercialize it
<b>Affordable Loss</b>	To start his current company he said they just went for it. The risk wasn't that high and they knew that if they failed they would have no problems getting a new job	Entrepreneur B said he could afford to fail or lose his business venture. Particularly since he still had his primary job	Entrepreneur C was sure he could go back to a "normal" job in the industry, due to having job offers at several companies. He did neither have any loans or greater financial values to lose, if things were going to go bad	Entrepreneur D explains how people with the same kind of IT education as himself has a very good job market, and that it is relatively easy to get a well-paid job in the market today. However, it is the drive to do something on his own that has made him start up his own venture	Entrepreneur E said it's important not to have high expectations that would get him into a difficult situation and have a hard fall
<b>Lemonade</b>	He likes being in a chaotic start-up situation where there are many problems to solve and he wants to be involved in something from beginning to end	Originally wanted the company to provide scientific services and develop own materials, but was unable to get talented scientists. Instead found a 'computer wizard' and the company is developing scientific software			Had to redirect projects and production in new direction because they weren't successful, but his technology is very flexible and he enjoys the research this allows him to do
<b>Patchwork Quilt</b>	When he starts his next project he wants to make sure he has a pre-commitment from a customer or potential partner before he starts	Forskningsparken had been encouraging him to start a company for many years, so when he decided to, it triggered many systems to support him	He uses is network and reputation to good effect in getting partners and commitments from customers	He offers his software for free to get pre-commitments	Does product development from what customers are specifically asking for
<b>Pilot-in-Plane</b>	By waiting for one great idea they can work with they are focusing on activities within their control and they know that their actions will result in their desired outcome	Knows he cannot control future customers, so controls stock materials to minimize exposure to low turnover	He said he was no economist. And he had no knowledge on how the economy was looking 3-4 years from now. He was neither keen on making business plans as it took up too much time, and he did not know how to do it. He said he did not have any knowledge on how to do any of those things - we can see how he rather kept things within his control		Entrepreneur explained he can control what he purchases based on the company's available funds, but does not make budgets since he cannot predict future sales
<b>Do Effectuation/ Think Causation</b>	The Entrepreneur wrote a business plan only to get funding from Innovation Norway. He also mentioned that for companies who need investments it is probably a good idea to have a business plan	Knows he cannot control future customers, so controls stock materials to minimize exposure to low turnover		Entrepreneur D seemed to only have written a business plan to please the system/incubator he was starting his company with	

Table 10: Entrepreneur Effectuation Example Synopses

Causation	Entrepreneur A	Entrepreneur B	Entrepreneur C	Entrepreneur D	Entrepreneur E
<b>Pre-set Goals and Opportunities</b>		Knows he cannot control future customers, so controls stock materials to minimize exposure to low turnover			
<b>Expected Return</b>		He is on the board of a second company that is selling a dream and will first have high expenses before any possibility of a return		The Entrepreneur minimizes risk by having an insurance	
<b>Avoiding Surprises</b>		He designed the business model to have not costs until someone orders their product			
<b>Competitive Analysis</b>		Thinks entrepreneurs need to know their market very well			
<b>Inevitable Trends</b>		See his initial estimate of market and demand for his product is behaving according to his predictions			

Table 11: Entrepreneur Causation Example Synopses

Effectuation	Student A	Student B	Student C	Student D	Student E
<b>Bird-in Hand</b>		Identify a problem and based on his background, how can he fulfill the need	Based on what Student C has learned the last year she says that a great team can help you do anything		Believes one's ideas and team are more important than having financial backing
<b>Affordable Loss</b>					Recognizes that potential rewards run parallel to risks, but she is not interested in big risks
<b>Lemonade</b>	Student A answered that he would work around unforeseen events	Thinks it important to make the most of surprises and look for their positive sides			Sees value in not being averse to making changes and being light on one's feet
<b>Patchwork Quilt</b>	Student A is keen to network, talk to people and to get hold of the best human capital. Student A would like to "get out there" and test an idea	Thinks it's important to look at how an idea is relevant and good for everyone		Student D believes that sometimes you have customers that tell you how they are willing to buy your product, without even having a business plan	Would approach people about her opportunity get people that believe in the idea – a self-selecting group of colleagues
<b>Pilot-in-Plane</b>	Student A said that he would put up milestones, but change them as the market changes		While student C completed her bachelor her and her classmates came up with a lot of good ideas and products, but no one knew how to "take them to the next level" so she wanted to learn what she could do within her control to publish or commercialize them	Student D does not try to make predictions about the future, he says that he will meet an unforeseen problem with an unforeseen solution	
<b>Do Effectuation/ Think Causation</b>			Even though she says to not worry too much about problems, she says that there should be someone who can take care of them while the entrepreneur "goes for it"		

Table 12: Student Effectuation Example Synopses



<b>Causation</b>	<b>Student A</b>	<b>Student B</b>	<b>Student C</b>	<b>Student D</b>	<b>Student E</b>
<b>Pre-set Goals and Opportunities</b>		Thinks it's important to ID a problem, visualize a solution and develop a business plans with firm goals		Student D says one should set milestones and strive to achieve them	Sees the startup process as having a lot of upfront costs and need the initial capital during that period
<b>Expected Return</b>	Student A wants investments from Innovation Norway when he starts up a new venture	Thinks it is important to do market and financial analysis to determine the needed resources and then pitch idea and search for funding		Key obstacle is to get hold of money	Needs to be confident about fully fleshed out idea before looking for partner or money
<b>Avoiding Surprises</b>		Would use risk management process and contingency plans in the business plan to avoid unforeseen problems, risks, and uncertainty			
<b>Competitive Analysis</b>					
<b>Inevitable Trends</b>		Would read a lot about trends to determine what's happening and reduce uncertainty by getting the facts			

Table 13: Student Causation Example Synopses

## 4.2 Interview Analysis

This section is devoted to analyzing the different groups internally; comparisons of what the different members of the groups say and what their actions mean. In the end a prototype of each group (Expert, Entrepreneur, and Student) will be given demonstrating literal replications.

### 4.2.1 Expert – Intra-Group Analysis and Synthesis

#### Bird-in-hand versus Pre-set Goals or Opportunities

From the pool of Experts who were interviewed, all of them partook in the Bird-in-hand or Pre-set Goals or Opportunities discussion. Expert B and C followed the effectual side of the discussion, while Expert A and D showed examples of both effectual and causational sides.

Expert B looked for people who had the experience and know-how to share with him.

*“Well, you just have to dive into it. And constantly look at who one can use as support. If you sit down and say, I'll have to read this to do it on my own. That won't work. You need to figure out - who has gone down this road before. Who can I ask? Who has the knowledge?”*

Expert B

By taking that step towards finding new people, and in effect new means he is using the effectuation theory of Bird-in-Hand. In a similar way Expert C said that he always uses his network to expand his business and tap into new markets and new businesses. Similarly Expert D used his friends and connections in different places to start his company and he used funding from his employer.

Expert A said that in a large company such as the one he works for there are milestones and goals to work towards and there are plans to follow. However, this type of thinking might only be because of the rules of the company that he works for, he also mentioned that because he had worked for the company for 15-16 years he was able to get the position of CMO. This may show that by using his means he got what he wanted and in turn followed effectual

thinking. At the end of the interview Expert D mentioned that as they had become a larger company they now have more goals and plans. *“Of course the bigger you grow the more firm plans you need. So right now we are working more deliberately towards certain goals compared to some years ago.”* - Expert D

From looking at what these Experts say they all mention network as something that is an important part of venturing. However, it is the way or intention that these networks are used that determines if they act effectually or causatively. Expert D’s comment is demonstrative of how entrepreneurs use their network effectually:

*“I think everybody says you have to believe in it, you have to understand the market and you have to have the right timing. But, very few of those points, they fall down every time you do it, but we were quite lucky, we had the right timing, we had the right know-how, and we had the right means to do it.”*

Expert D

We feel that Experts B, C, and D represent the Expert group as Expert A works for a large corporation. Expert A’s comments about the practices of pre-setting goals is representative of standardized protocols for employees to follow at large companies and may be less representative of Experts. Also, Expert D’s comment about having goals and plans seemed to only be because the company is now larger and a certain framework for goal-setting has to be made. Due to the manner Experts B, C, and D’s use their networks, and Expert A’s personal networking behavior, we can say the Experts follow the Bird-in-Hand principle.

### **Affordable Loss vs. Expected Return**

Three out of four Experts mentioned the Affordable Loss and Expected Return discussion. Two of the Experts mention different actions that fall into both the Affordable Loss and Expected Return categories and one Expert falls into the expected return category.

Expert B has followed the expected return mentality because he has written a lot of business plans, which is considered having an ultimate goal. Further, the company he is currently running is dependent on investors and this is also considered causational.

*“Yes, we wrote business plans all the way, as we went on...Ha-ha... You work a lot with that... and also you play a bit ball towards the investors, then you come back and*

*so on...but it is also how you are sitting and writing that business plan. .it is really hard to...it is really hard to sit down and say this is my plan.”*

Expert B

Expert B was not the only one amongst the Experts to write a business plan. Expert C said he wrote a business plan to the best of his ability. This shows that Expert C is causal by following Expected Return thinking. However, he is also effectual in the sense that he always has a plan A and a plan B and this is considered Affordable Loss as he also said he only takes the risk that he can afford.

Expert D's actions follow an effectual viewpoint; he said that when he started his company he knew that if he failed he still had a job and an income from his previous employer. He said: *“The good thing was that we were still, we had [parent company] there as something we owned, so if everything had collapsed we would still have jobs, an income.”* This is considered Affordable Loss because he has chosen goals and actions that even if they result in failure he will not be ruined. However, Expert D also mentioned something that is considered Expected Return and causal.

*“because that was my interest, I wanted to develop the newspapers and keep the customers, then we realized we had to make something new, otherwise we would just lose them to foreign companies, English, American companies”*

Expert D

By having a goal to make something new because of the fear of losing customers to competitors is like trying to reduce the risk of operating. Reducing risk and their fear of competitors can be interpreted as Expected Return.

From the statements above it would be difficult to classify Experts following either Affordable Loss or Expected Return, as there are almost an even number following each concept. And that two of the Experts portray both theories. It is inconclusive whether or not Experts exclusively use one or the other category. Differences in industry, educational background and training, or cultural norms may result in application of Affordable Loss versus Expected Return logics. Further in depth study focused on these Expert differences would be needed to make conclusive remarks.

## **Lemonade vs. Avoiding Surprises**

Out of the four Experts that were interviewed, three of them mentioned something that fit into either the causational side or effectual side of the Lemonade versus Avoiding Surprises debate. They all said something that fit with Avoiding Surprises, but Expert A also talked about an action that fit with the Lemonade principal.

Expert A mentioned that he had to make sure that he could turn any marketing event into a positive one, even if they were negative. This is a classic example of creating lemonade out of lemons. However, he also said that he always had to be prepared for any question during a press conference or just talking to people, this is considered avoiding surprises.

During his interview Expert B seemed very concerned with how a protection to an idea is important; he wants to make sure he has the correct IPR in place before he continues working with a product. He talked about the TV-show Dragons Den where entrepreneurs show their ideas to investors:

*“A lot of the people on that show has already taken up a large mortgage. And some of those people may be asked the question ‘what on earth were you thinking when you did that?’ For instance you have something that cannot be patented, what is so unique then? why can't a Chinese copy this”*

Being so concerned about patents is considered Avoiding Surprises and causational, if he had been more effectual he would perhaps look upon this as a chance to find a new market.

Expert C is definitively thinking causational when he states that he always thinks 5-10 years ahead, this is a classic example of Avoiding Surprises.

When it comes to Lemonade versus Avoiding Surprises it is clear that most of them do not invite surprises and this is considered causational. It is interesting that this is a contradiction to Sarasvathy's expert entrepreneurs who do invite surprises. From this we conclude that the Experts in our interview pool follow causation when it comes to surprise avoidance.

## **Patchwork Quilt vs. Competitive Analysis**

All of the Experts mention something that fall within the Patchwork Quilt versus Competitive Analysis. Actually, they all fall within the Patchwork Quilt category and effectuation.

Expert A said that he keeps close contact with all the companies they are in contact with; some of these companies are partners while others are customers. As the CMO, Expert A has to be good at networking and this follows the thinking of the Patchwork Quilt and effectuation.

Expert B stated that it is important to find people who have gone through what you are going through before. He tries to find these people and learn from them. We interpret that this is as Patchwork Quilt because he is going out to find other people with knowledge he needs and he tries to get a commitment from them.

*“Well, you just have to dive into it. And constantly look at who one can use as support. If you sit down and say, I'll have to read this to do it on my own. That won't work. You need to figure out - who has gone down this road before. Who can I ask? Who has the knowledge? “*

*Expert B*

By going out and actively trying to find people who can help him, Expert B is thinking effectually and using the Patchwork Quilt theory. Expert C also uses the Patchwork Quilt theory and this is shown when he made his previous employer become his largest customer once he started his new firm. This is Patchwork Quilt and effectuation as he got pre-commitments from his previous employer before he started his venture.

From the beginning Expert D knew he wanted to use partners as a way of selling their software. Expert D's firm got pre-commitments early in the venture from partners wanting to sell their software and be a part of their venture.

*“to sell something you need to have a distribution channel. In Norway we could handle those customers ourselves. So that was quite easy, we knew the newspapers and, I personally knew them all, so we could very easily approach them and sell new things. It was really like selling ice cream in the Sahara at summer time.”*

*Expert D*

Here Expert D states that he knows newspapers and many of the customers personally, so then to go out and get pre-commitments or sales from them was as he said: *“like selling ice cream*

*in the Sahara at summer time.*” These actions show that he is thinking effectual and that he follows the Patchwork Quilt theory.

As all four of the Experts talked about actions that fall within the Patchwork Quilt category we can interpret this as the Experts acting effectual in this category. This shows that getting pre-commitments is an important part of being an entrepreneur.

### **Pilot-in-the-plane vs. Inevitable Trends**

Out of the four Experts we interviewed only two of them mentioned anything that would fit in the Pilot-in-the-plane and Inevitable Trends discussion. Expert D’s company focuses on activities within their control like changing their goals and activities to fit with reality. When asked if his goals had changed he answered:

*“I think they have changed all the time according to reality, of course you want to have some goals, but sometimes you just have to admit that the goals were wrong or the market was different and you have to change it. This is good with a small organization so that you can change directions very quickly. If things are going well you can do more in that area, if it goes bad you can change it very quickly. The good thing for us is that we have the financial resources to, more or less do exactly what we want; we don’t have to ask anyone. And that’s the big big advantage.”*

*Expert D*

This shows that Expert D’s company focus on actions within their control and this is effectual thinking and in turn it follows Pilot-in-the-Plane theory.

However, Expert B was on the other side of the discussion when he said the following:

*“So [company name] as it is today did continue to produce products... To start with our plan was to produce for the end user around the world, and use the internet as a marketing channel, yet again we were a bit too early out there. It is the last years that web shops, logistics and so on have taken off. But we also chose a market where there was a couple of super strong international players, so, so it was a bit like David against Goliath.”*

*Expert B*

This is causal thinking as he is accepting the market how it is and he does not do anything to change it. To solve this problem they hired a new CEO that would move them to a new market that was also already established.

Evidence of a worldview in either the Pilot-in-the-Plane or Inevitable Trends categories only came out in the discussion with Expert B and D and they each made opposing statements on the Pilot-in-the-Plane versus Inevitable Trends discussion. Thus, it is difficult to make a general conclusion about Experts.

### Expert Prototype

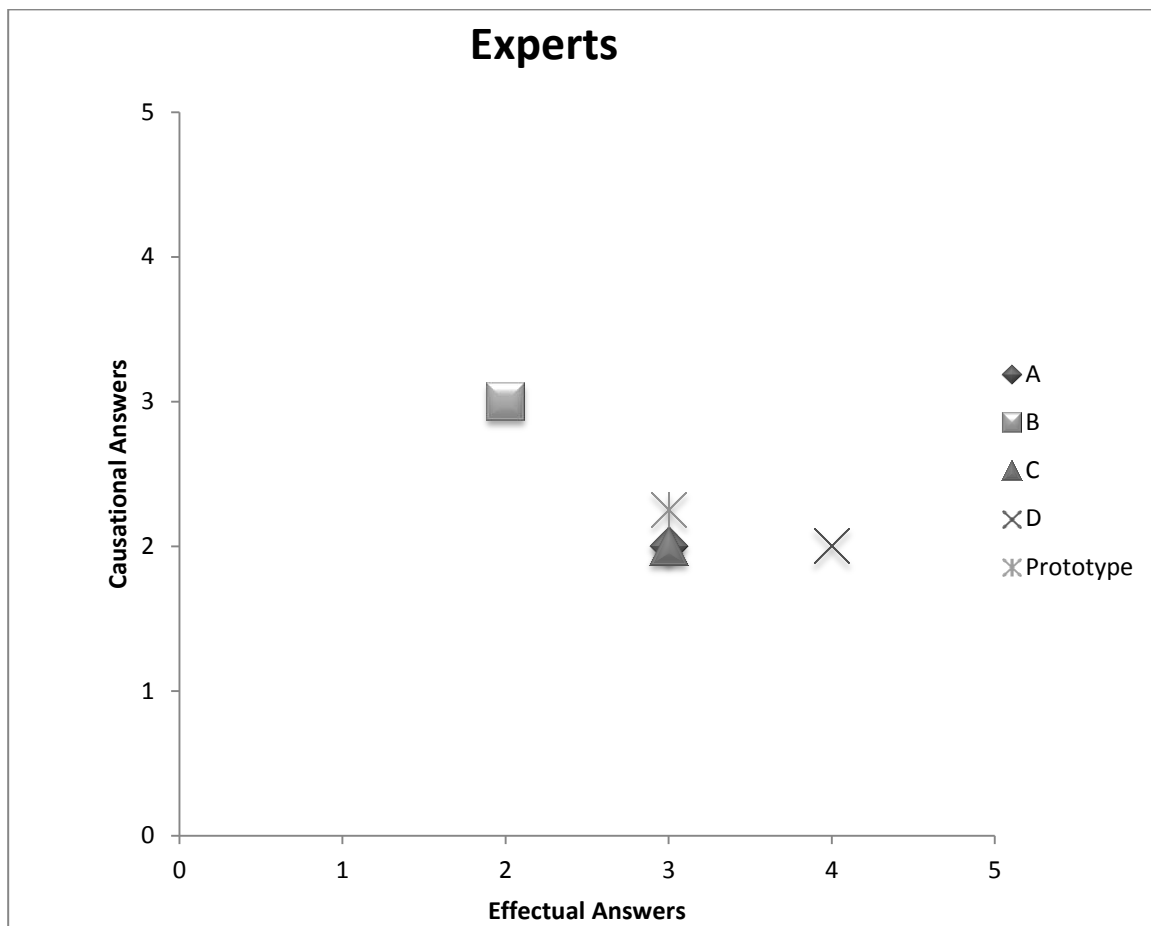


Figure 6 Experts' effectuation and causation indexes

Experts demonstrated effectual patterns when it comes to assessing their means and opportunities, as well as using their networks to get the pre-commitments necessary. However, they do attempt to avoid surprises which are considered causal. We can see from Figure 6 that three of the four Experts are mostly effectual and one of them, Expert B is



more causational than effectual. We can see from both the Intra-group explanation building and Figure 6 that the Expert prototype is more effectual than causational. Further the figure demonstrates clustering around the prototype Expert. Thus we can interpret this as demonstrating literal replication. As a conclusion we can say that Experts are effectual, except that they seem to avoid surprises. This could perhaps be accounted for because of the current financial crisis that seems to be affecting everyone and how they run their business.

## **4.2.2 Entrepreneur – Intra-Group Analysis and Synthesis**

### **Bird-in-hand versus Pre-set Goals or Opportunities**

All the Entrepreneurs recounted moments demonstrating their use of the Bird-in-Hand principle in the startup phase of their firms. They each made statements referring to a combination of their available resources (tangible or intangible) to start a venture. However, full evaluation of one's means was most clearly expressed by Entrepreneur B in answering why he started his firm:

*“I guess two reasons. One was this encouragement that we should do that kind of thing. That was one. The second thing was that I saw some people in – around science that were earning money on science. Like having consultancy companies and other companies that sold its services to research. I thought, at that time I thought my salary was pretty low and, I mean, it was the future, and – or economical future of being a professor. I thought it would be nice to have a company that I can use as a tool if I take a job for Sintef or someone, and I should get paid rather than just doing everything for free. Which is what we usually do. The company would a good way to write invoices and things like that. So, starting a company is a good idea, in general, I thought. Let's try it. And the third thing – three things – is that we had – then we were looking for something to start a company based on – and we had everyone in our business used a particular product.”*

He recognized he had a supportive community (also expressed by Entrepreneur D), valuable knowledge in demand, and knew of a product used by everyone in his line of work.

Four of the five Entrepreneurs (A, B, C, & E) made particular reference to the need to maintain income or generate revenue immediately. Entrepreneurs C perhaps best captured this sentiment in the statement:

*“...I started the individual enterprise as a consultant. To earn money. I started to make some internal products. I had a good idea at the time. And this led to doing 50% consultancy ‘to survive’, and 50% product development. So in this way I financed myself, without investors.”*

Recognizing his knowledge as a valuable asset – which is common across this group of entrepreneurs – Entrepreneur C was able to fund his venture through consulting work on the side. In fact, Entrepreneur E was the only member of this group who did not specifically mention doing consulting work. Though, he did recognize the value of his knowledge. Three Entrepreneurs (B, D, & E) made specific comments regarding how to commercialize their intellectual property – means. Entrepreneurs B and E distinguished between selling an idea or dream to investors versus selling a tangible product from the get-go.

*“Either you can sell your idea and someone is buying it and investing money into your ideas. Or, actually what we more are doing here is actually we...the ideas are generating products that are attractive and can be sold.”*

*Entrepreneur E*

Interestingly, they both have similar academic training and chose to sell a tangible product over selling a dream. However, Entrepreneur E decided to use his intellectual property as a process to generate specialized products for his customers. Meanwhile, Entrepreneur B chose to sell his knowledge directly to customers as a standardized product. These are examples of how all the entrepreneurs are trying to capitalize on of their unique knowledge beyond consulting work. After all, none of the entrepreneurs’ ultimate intention was to start a consultancy firm. The limits to consultancy work and the value of their time as a means is best stated by Entrepreneur D:

*“If you are doing consultancy, which is one of the things we figured ourselves doing. Spending a lot of time in, being our focus. Then you can only sell one hour one time. If you are using that hour at one customer, then you can’t sell that hour multiple times. You have an upper limit on your income. You have an hourly price, on how much you*

*need for a given hour. Then it is a limited amount of hours every day. And that gives in a practical sense how much you can earn during a day and during a month and so on. That. You can adjust how many hours you work and you can adjust the hourly price. Apart from that it is very limited how much you can earn as a consultant. To grow you need more staff, but again you then need to pay out more salary. So it is...if you then compare this to software development, then you can develop a proprietary software solution, so you can sell, there is no limit on how many time you can sell that hour you spent developing that solution. This is a calculation we have done with time."*

Entrepreneur B is the only interviewee who made comments suggesting he also started with Pre-set Goals or Opportunities. Due to the subjective nature of interpreting subtle meanings, careful analysis is needed. In speaking about his company's industrial sector, Entrepreneur B highlighted his belief in the importance of a firm's purpose and goals. Pre-defining goals and clearly defining a single opportunity is associated with causal behavior. To this end, it may be easy to see Entrepreneur B's statement below as causational thinking. *"You know when you start a company; you have to define what's the purpose of the company."* Effectuation theory starts by pre-defining one's means to identify a variety of potential 'effects' or opportunities to pursue (See Figure 3). The focus on identifying multiple paths to follow, in effectuation theory, does not preclude setting goals and defining a purpose once a decision to take a certain route has been made. Indeed, it is hard to imagine not having some sense of what one is doing as an entrepreneur. Further analysis of Entrepreneur B's interview reveals he defined his firm's goals broadly; he aimed to commercialize science research originating from his university. The goal provides a large degree of flexibility and leaves the firm open to several effects.

While defining goals can help sharpen focus, these entrepreneurs have used the Bird-in-Hand principle to first identify which opportunities are available to them based on means they can control. This is the starting principle in effectuation theory. We can say our pool of Entrepreneurs is effectual in their actions regarding Bird-in-Hand and the plunge event.

### **Affordable loss versus Expected Return**

All five Entrepreneurs from this group gave answers using Affordable Loss rationale for why they started their ventures. The two IT Entrepreneurs (A & D) and Entrepreneur C (the robotics engineer) were confident they could easily find a normal job if their firms failed. The

three of them know there is a strong job market for IT and robotics skills and knowledge in Norway. A fourth, Entrepreneur E, stated he would have to return to the job market, neither expressing the confidence or great concern of finding work. Entrepreneur B retained his professorship position and so did not need to worry about lost income.

Entrepreneur A acknowledged his priorities had shifted between his first startup and his current venture. As a student, Entrepreneur A had minimal financial obligations and student financial aid from the state, which he invested in his first startup. Thus, he had little to lose and much to gain from his first venture. This line of thinking was also replicated in Entrepreneur C's logic for business venturing:

*"Yes... So the risk I had was really nothing. I made sure of that... It was mostly economically. If I had owned an apartment, had a mortgage, the only thing I had was the study loan, then there isn't much you lose if things goes to hell."*

Minimal debt obligations, personal net worth, and general cost of living expenses were not tying up future capital of Entrepreneurs C and during Entrepreneur A's first venture. In addition to market assurances such as job opportunities and consulting work, Entrepreneurs A and C could easily control their personal economy. Their greatest cost being their forgone potential earnings: *"...I could apply for a job and I would earn more there than with what I was doing. Times three, for sure. And you lose nothing (Entrepreneur C)."*

Now that Entrepreneur A has children and a mortgage, he has changed his financial metrics. However, he still demonstrated use of the Affordable Loss principle. Entrepreneur A knew he could not sacrifice a steady income for more than a couple months, but also knew he could do consulting work on the side. Additionally, if he were desperate, he is confident he could find a normal job in IT within a couple of hours. Thus he could sacrifice a couple months' pay and a steady job to start a new firm.

Entrepreneur E expressed an intrinsic motivation for starting his firm and application of Affordable Loss logic. He could not afford to lose acting on an opportunity. A keen interest in science and research, Entrepreneur E could afford to quit his job he no longer enjoyed to pursue his own projects:

*"I mean, I would rather put my time and efforts into something I believe in, than what I don't believe in...So, I decided to try that out myself...If this is going to be the life in*

*future. You know, somebody decides something and you have to jump, you know. It's like this all over, in this world these days; in our business. Mergers, layoffs here and there, so on and so on. I mean, why not try to do something on your own? And be a little independent."*

Beyond the 'plunge' event, Entrepreneur E has continued to practice Affordable Loss logic, best expressed in the exemplary statement: *"Don't put yourself in a difficult position. Don't raise your expectations so much so that you fall too hard."*

Two interviewees from this group (Entrepreneurs B and D) also expressed following the causal practice of Expected Return. Entrepreneur B serves on the Board of a second company that is 'selling a dream' and will not generate income for several years. In selling a dream of future revenues, Entrepreneur B and the company are selling anticipated future revenue to investors who have an Expected Return on their investment. Entrepreneur D, on the other hand, discussed how they employ Expected Return principles to minimize their risk exposure through corporate structure and insurance purchases.

Of the five interviewees in this group, Entrepreneur E best exemplified use and application of the Affordable Loss principle. However, he is not representative of the group. A prototypical Entrepreneur uses Affordable Loss logic during the plunge decision, but will also shift towards using Expected Return logic in *some* decision making – such as in corporate structure and apparent risk factors covered by insurance plans. We conclude that the prototype Entrepreneur employs Affordable Loss thinking to effectuate on their means.

### **Lemonade versus Avoiding Surprises**

Three Entrepreneurs (A, B, & E) in this group have contended with unforeseen events; most venture, business or otherwise, will experience surprises. Further, the three Entrepreneurs explained how they have dealt with such events. However, Entrepreneur A was the only Entrepreneur to express a desire to seek out surprises in his choice to leave his job to do startups:

*"...it was totally different from the small startups where everything is chaos and you kind of have to do everything, so, but to me it was very clear that after a year I wanted to be in these small startups like where everything is chaos and you have to find out, and do all of these things from the beginning and find solutions. While in McKinsey it*

*was more kind of... [inaudible]...numbers and look at plans and find out where to, yeah, where should we go and what should we go into and what companies should we buy, and it got so far away, kind of, from the real, that we didn't get real dirt on your hands and so, to me it was much more fun to go back to startups."*

The above quote is exemplary of the differences between startup culture of leveraging surprises into learning events and opportunities versus corporate risk and opportunity assessment. While Entrepreneur A was the sole interviewee to express his desire to seek out 'chaos', this may be in part due to his contrasting experiences as a founder and corporate consultant. He clearly expresses a preference towards finding solutions in a chaotic environment. An interesting and plausible alternative process of surprise seeking behavior is the experimental mentality as applied by the two scientists in the group, Entrepreneurs B and E:

*"I'm a scientist and I like to think about what I'm doing; I like to try and see if it's understandable. Not understandable. How can I learn to understand it? And if you do start to learn how to understand something that nobody else understands, you might be on your own trail in a way. And I might be totally wrong and hit a wall. Or, you might be right and you actually find an area, for example, that nobody else has explored. That's a pretty good situation if you want to file patents."*

*Entrepreneur E*

Essentially using the experimental process in science, Entrepreneur E is looking to leverage surprising solutions to gain insight and a commercial advantage over competitors. This is similar to Entrepreneur B, who believes continuously exploring his various ideas is necessary to innovate and stay competitive.

Beyond surprise seeking, two Entrepreneurs (A & B) recounted events in which they turned a negative situation into a positive opportunity. The resulting changes were in their customer base, products, or target markets. The challenges ranged from available human resources to a crowded industry (See Table 14). However, Entrepreneur E said his general approach is to not worry about what he cannot control. When asked how he dealt with unforeseen events, Entrepreneur E answered:

*“I mean, I hadn’t really had any – I didn’t really go into this with a lot of thoughts. It’s just that I’m getting fed up by this expected – my career expectancies from an employment and I think that I should try something else. So, that was my – I think that it can be more interesting. That’s my expectancy. And, there’s nothing unforeseen there. It’s always been much more pleasant than any other way I could have think – thought of.”*

While interpretation can be difficult, the quote demonstrates Entrepreneur E’s unperturbed attitude towards unforeseen and thus uncontrollable events.

Entrepreneur	Challenge	Solution
A	<i>“...I think we stopped to late, because we were hoping for, because we were earning some money, so if it would just continue now, probably the other companies would die, and they did, but there were coming new companies there all the time.”</i>	<i>So, then we had to stop and we changed everything to just becoming a real, a pure provider of technology.</i>
B	“Originally wanted the company to provide scientific services and develop own materials, but was unable to get talented scientists.”	Instead found a ‘computer wizard’ and the company is developing scientific software.

Table 14: Entrepreneurs' practicing the Lemonade principle

Perhaps the only indication of practicing the Avoiding Surprises principle, involved issues of control. Entrepreneur B structured his firm to minimize upfront costs. That is, the firm keeps a sparse inventory and builds to order. This way he is able to avoid or minimize exposure and cost of surprise economic shocks such as the 2008 global recession.

We can say a typical Entrepreneur will encounter unforeseen events and will therefore make a choice to shift towards a positive result. Most of the entrepreneurs demonstrated this behavior and three of them were surprise seeking. So, we conclude they employ the Lemonade principle in effectuation theory.

## **Patchwork Quilt versus Competitive Analysis**

In building up their firms and competencies, each interviewee in this group has benefitted from activities expanding their network. The Entrepreneurs appear to make particular use of the Patchwork Quilt principle by acquiring self-selecting stakeholders. Due to their various industries and types of products, this partnership building process was described similarly across Entrepreneurs A, B, D, & E. These four Entrepreneurs looked for pre-commitments from either customers or potential partners before either pursuing an effect or developing a new product.

For example, Entrepreneur A is looking for both an idea that excites him and to get customers prior to starting a new project. Further, he explained how he is able to get his first customers in building a patchwork of stakeholders:

*“these projects we are starting is something that I have been burning for so it’s kind of, I feel kind of very full of energy doing these projects and I don’t think it is not necessary that difficult to get this first customer, as long as they don’t have to risk that much.”*

*Entrepreneur A*

While Entrepreneur A did mention identifying the customer’s pain, he also sees minimizing the risk they take on for gambling with an untested enterprise.

Entrepreneurs D found an interesting way to decrease his customers’ risk by developing a two tiered product. He offers free software and a premium support service. The approach allows him to get buy-in from customers with little risk and upsell support services. In providing support services, Entrepreneur D has listened to the needs of paying customers to shape and improve his product as a service. Similarly, Entrepreneur E has used customer purchases to formulate new products according to their needs. Thus, both Entrepreneurs D and E have used pre-commitments from customers to do product development.

Prior to deciding to take the plunge into business venturing, Entrepreneur B had been solicited by a future stakeholder, the research park:

*“Ah, that was easy because we were here [Forskningsparken] for ten years not doing anything. And sometimes because I meet these persons saying: ‘Come on [interviewee’s name], when are you going to start a company? Come on start a company!’ So, when you say: ‘Ok, I start a company now.’ And suddenly you trigger a lot of systems”*

This is a classic case of getting or having stakeholder pre-commitments during the startup phase. Entrepreneur B had taken the first steps of effectuation and then quickly got stakeholder buy-in from the local research park. The research park then helped shape the future company. Meanwhile, Entrepreneur C has used networking and his reputation to good effect in getting partners and commitments from customers:



*“There I had some other customers. And I created a name for myself. Because I made two large systems by myself - which led to my name being known. This led to me being able to... I was not agreeing with my old boss, and I had the opportunity to quit and I started on my own. Without... I did not steal any customers or anything like that, I took nothing from them, so I was very loyal with them. But I had a name, and I got this project. It started with one, and are they happy they will talk to people. I have never done any marketing...It does only go through network.”*

While Entrepreneur C has been building a network through customers, Entrepreneur A also applies the Patchwork Quilt principle internally for his firm to find self-selecting partners.

*“But we know that in order to attract good people, we know we kind of have to get them as partner and that is kind of the advantage we have compared to an IT company, Telenor, Statoil, whatever, you know, so, they can give good salaries and they have good careers and all that stuff, but we need to find people that want to be more controlling all the aspects from the beginning, and Yes, we can kind of give the same salary more or less, but it'll be more unsure and yeah, this is the difference I think.”*

This demonstrates Entrepreneur A recognizes the need to get the right people involved and the relative disadvantage he is in as an employer.

In effect, all the Entrepreneurs have used self-selecting stakeholders and pre-commitments to start and develop their firms. We can say this group of interviewees has practiced the Patchwork Quilt principle of effectuation in their ventures.

### **Pilot-in-the-plane versus Inevitable Trends**

Four of the five Entrepreneurs (A, B, C, & E) appear to have used Pilot-in-the-Plane actions and worldview. The Entrepreneurs revealed decisions to choose controllable actions throughout their interviews when discussing a variety of aspects to running their firms. Entrepreneur A best expressed the control view when stating “[b]ut I think the most important is to be in charge of the processes and play with ideas and what you like to do and have that freedom.”

Part of Entrepreneur A's Pilot-in-the-Plane method is seen in his initiative to found an IT consulting firm while searching for an idea. Unlike at his previous employer, Entrepreneur A has more control over the projects he works on and allows him to search for and explore potential venture ideas. In this manner, he is taking actions he can control that will eventually lead to the desired outcome to find "*...that thing that we really want to spend the next 10 years or so on.*"

On the other hand, as an equipment manufacturer, Entrepreneur B has identified two key aspects he can control to achieve the results he wants. First, tight controls on inventory and production allow Entrepreneur B to be able to take charge of networking capital. Rather than using production output driven sales, he flipped the equation to have sales driven production output. Similarly, Entrepreneur said he bases purchasing decisions on available funds, expressing the same line of thought. In fact, Entrepreneur E does not prepare budgets, since he cannot control or predict future sales. Foregoing formal budgetary planning, Entrepreneur E counters Aspara et al. (2011) argument for updating plans as the need arises. The market changes too fast or is simply too uncertain. Second, focusing on quality and customer satisfaction, Entrepreneur B takes ownership of his firm's reputation. Both activities demonstrate a Pilot-in-the-Plane mentality of Entrepreneur B. However, he also expressed an Inevitable Trends predisposition in his calculus of his firm's total addressable market and total likely sales falling in-line with his estimates. Interestingly, Entrepreneur B did not provide any indication he has focused on pushing sales. Rather, he spent a good portion of the interview describing his interest in finding solutions for his customers, even at the expense of reduced profit margins.

Perhaps the most interesting commonality of all five Entrepreneurs is their disregard for business plans, yet each of them either wrote or attempted to write one. For example, Entrepreneur C said he was no economist, and that he lacked knowledge on how the economy would look like in three to four years from now. He was neither keen on making business plans as it took up too much time, and he did not know how to do it. He said he did not have any knowledge on how to do any of those things - we can see how Entrepreneur C would rather keep things within his control.

The Research Park, grant applications, and investors all required business plans. While the Entrepreneurs all view business plans as a waste of time, they still engaged in the ritual. After all, it is a relatively low cost and controllable action to get stakeholder commitments and build

legitimacy. Writing a business plan was about getting funding and partners, not so much about planning. They already had a high degree of certainty or confidence in the market.

While writing a business plan would hint at Entrepreneurs following the Inevitable Trends logics, it can be interpreted as a control tactic for gaining pre-commitments and making their future. In light of the additional evidence demonstrating control behavior, we can conclude the Entrepreneurs follow the Pilot-in-the-Plane principle and are effectual.

Entrepreneur	Consulting	Product type
A	YES	IT
B	YES	Equipment
C	YES	Equipment/automation
D	YES	IT
E	NO	Materials

Table 15: Entrepreneurs and their consulting work.

### Entrepreneur Prototype

The Entrepreneurs in this group did employ some causational logics, but the overriding tendency in all categories was interpreted to be effectual. The prototype, as seen in Figure 7 is overall an effectual actor. Four Entrepreneurs had indices clustering around the prototype. The fifth Entrepreneur, while not close to the prototype, is both causational and highly effectual. Thus we can comfortably interpret the prototypical Entrepreneur as achieving literal replication of effectuation. The typical Entrepreneur will work with what they have to create a more certain environment; they are effectual.

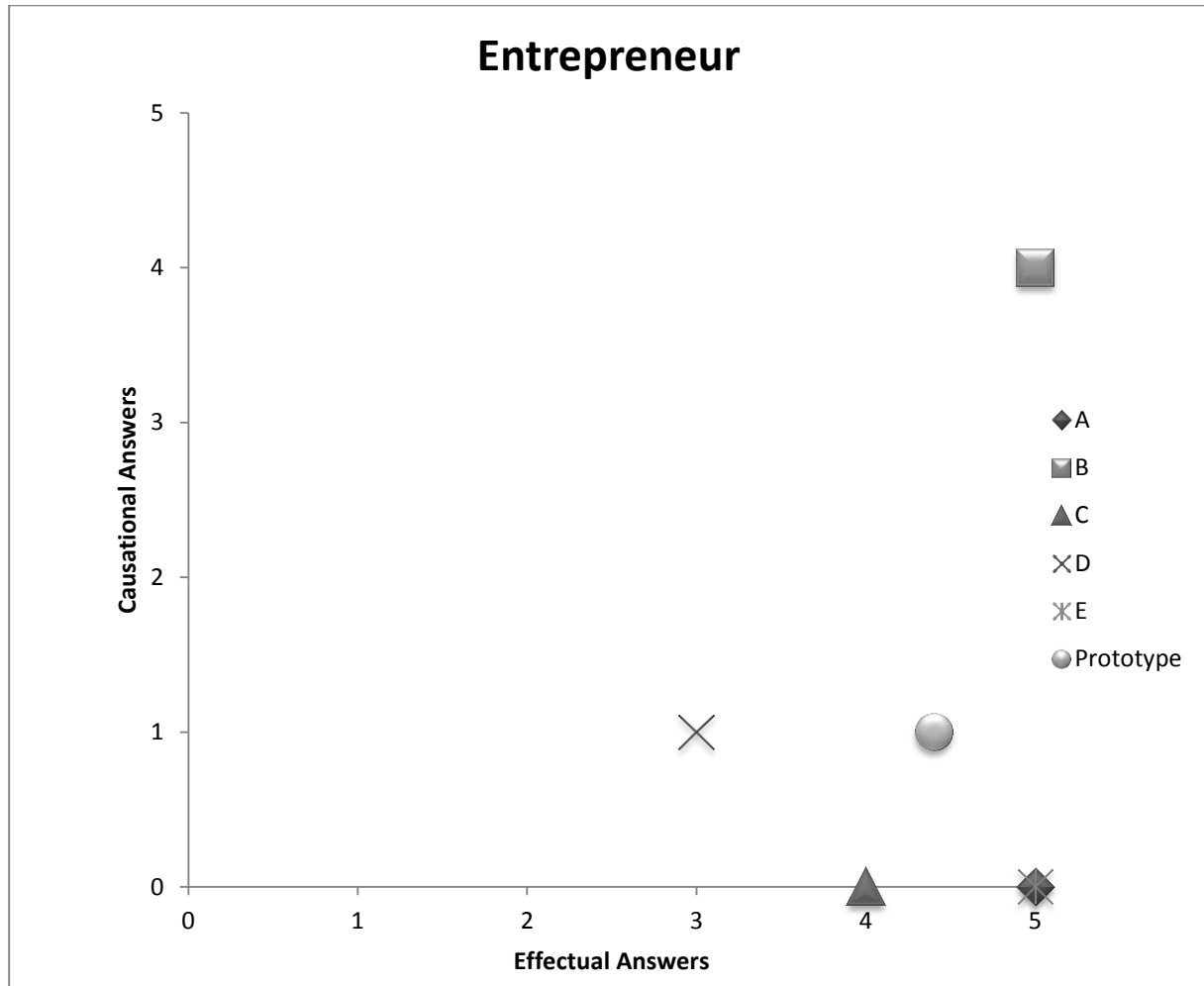


Figure 7: Entrepreneurs' effectuation and causation indices

### 4.2.3 Student – Intra-Group Analysis and Synthesis

#### Bird-in-hand versus Pre-set Goals or Opportunities

We see that four out of five students were part of the Bird-in-hand versus Pre-set Goals or Opportunities discussion. Students B, C and E represented the effectual Bird-in-Hand principle, while Student D was on the side of the causal Pre-set Goals or Opportunities. Student B would identify a problem or a need and based on his background he would see how he could fulfill that need. Student B wants to use his education to get a job to gather experience. This experience is what he plans to use when starting something on his own. He is then looking for an effect to create from the means he is gathering, as he states: *"My plan is to have a bit more experience in mobile technology. That's the thing I like so far. And then, maybe in 5 years have already something."*

It is also interesting to see how he is not sure on what exactly what to create, but more sure on creating something. This again fits well with the definition of effectuation itself.

Student C is very concerned about the team, and people in your network are part of your means. Student C stated *“Well, based on what I know, or what I’ve learned now is that having a great team! I think, well of course the demand, but I think you can do a lot with a great team.”*

Student E believes that one's idea is more important than financial backing. So, she is more focused on what her means can give her, than an Expected Return setting<sup>3</sup>. Student E is also concerned about the upfront cost of starting a business, which can be interpreted as a causational Pre-set goal.

Student D followed the causational path. He is concerned about milestones, and that one should strive to achieve them. Following milestones in such a way is pre-planning and also static which fits well with the causational process.

Three out of four who discussed this principle used the Bird-in-Hand. We therefore see that Students tend to follow the Bird-in-Hand principle.

### **Affordable loss versus Expected Return**

Four out of five students partook in the Affordable Loss versus Expected Return debate. All of these students showed the causational approach of Expected Return. However, there were also tendencies of the effectual Affordable Loss in student E’s interview, who seemed to follow a bit of both Affordable Loss and Expected Return.

Student A wanted investments from Innovation Norway when launching his venture. This is Expected Return in the way you raise money. Student B thinks it is important to do market and financial analysis to determine the needed resources and then pitch an idea and search for money. This is a classical way of doing it, and also causational in the way you raise money.

*“Like the market, like the financials, like the resources you will need. And then, after this you can start trying to look for investors right. Start pitching the idea to all the*

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<sup>3</sup> Expected Return is not the opposite of Bird-in-Hand. Expected Return is the causational opposite of Affordable Loss

*different entities which are in this context. Then once you have pitched your idea, you can start looking for funding and other resources.”*

Student B

Student D says that the key obstacle of starting a business is to get hold of money. This is very pre-planned, and Expected Return. Student D is then following the logic of how you need to raise a set amount of capital to be able to go through with your venture.

Student E is concerned about having everything work out, and then go out and search for money, which is causational Expected Return. However, she also states how she is not interested in big risks. Neither causational nor effectual entrepreneurs like big risk, but they cope with risk in different ways. Since Student E also had an acceptance for the Lemonade principle, we see this as effectual Affordable Loss tendencies. You are dealing with risk at every step of the way, avoiding all or nothing opportunities. So student E follows a bit of both theories.

Since all students who discussed the Affordable Loss versus Expected Return-debate followed the causational option, the prototype of Students follows Expected Return.

### **Lemonade versus Avoiding Surprises**

Only three of the students partook in the Lemonade versus Avoiding Surprises debate. All three showed how they followed the Lemonade principle. However, Student B followed both Lemonade and the causational Avoiding Surprises approach.

Student A, who had tried out the effectuation principle in real life, said he would work around unforeseen events. This is clearly finding contingencies, and seeing an upside in the downside. Student A stated:

*“Then I would have tried to work my way around it. I would not have quit for that reason. When you first start. But there might be a lot of other openings. You can twist your product into a new direction, without stepping on a patent. As an example.”*

Student B said that he would make the most out of surprises. While he, at the same time, in a more casual way said that he would like to have contingency plans and risk management, written in a business plan.

Student E is showing Lemonade principle tendencies with being open to making changes. She does not seem very rigid, and she is more or less inviting surprises by saying: *“I guess the key is to be light on your feet and flexible. And, not too averse to making changes to whatever comes your way.”* All three students who partook in this debate followed the Lemonade principle. We interpret this to signify the prototype of students follows the effectual Lemonade principle.

### **Patchwork Quilt versus Competitive Analysis**

Four out of five students partook in the Patchwork Quilt versus Competitive Analysis debate. All of those four followed the effectual principle of Patchwork Quilt.

Student A was keen on networking, talk to people and get hold of the best human capital. He would also like to 'get out there' and test the idea. This may not be a strong evidence of Patchwork Quilt; however the attitude fits with how you go out and make inquiries to get pre-commitments. Student E would in a similar way approach people, try to get hold of people that believed in the idea. Trying to get out there and get people to commit to your venture. We see this as Patchwork Quilt in the same way as we see this for Student A.

Student B thinks it is important that an idea is relevant and good for everyone. This in itself may not be a strong evidence of Patchwork Quilt. However, initially believing that this is relevant to everyone is an open mindset you need to make others commit. You are causational if you believe that every other market player is a competitor.

Student D believed that sometimes you have customers already signed up for an idea, without even having a business plan, he stated:

*“It would be most noble and efficient perhaps to have a complete business plan; the thing is though, that sometimes you just got the idea for it. And you can hear a lot of people saying already I want to pay for it. And that. That might not always be necessary to make that business plan.”*

We interpret this as a pre commitment and Patchwork Quilt. This may not be a cooperator, but it is persons committing to buying a product.

Since all students who partook in the Patchwork Quilt versus Competitive Analysis-debate followed the effectual Patchwork Quilt principle, the prototype student follows the Patchwork Quilt principle.

### **Pilot-in-the-Plane versus Inevitable Trends**

Four out of five students partook in the “Pilot-in-the-Plane versus Inevitable Trends” debate. Three followed the effectual Pilot-in-the-Plane, while student B followed the causational Inevitable Trends path.

Student A starts with saying how he would put up milestones, this in itself is more of the causational pre-planning, however, he continues to say how he will change them with how the market changes. This is someone being able to make milestones, which are within things he can control. He is not concerned about making future predictions of something he cannot control; he rather make changes as needed. So in total we see that this statement, which initially looked causational, however, we interpreted it as the use of the effectual Pilot-in-the-Plane.

Student C wanted to learn what to do with a product within her control to be able to commercialize them. We see this as Pilot-in-the-Plane; she wants to get a product within her control, or at least get sufficient control.

Student D answered in an interesting way when asked about unforeseen problems. He showed how he is not pre-planned, and rather copes with something unforeseen when the unforeseen is happening. He stated: *“Because how would I deal with unforeseen problems. Probably as for (mumbling) with unforeseen actions”*. Student B, the only one following the causational path, would like to read trends. Reading trends is classical predictive work, and Student B would do so to reduce uncertainty.

*“I think it’s about talking to people – those that are really experts in some specific field. Reading a lot of trends. For example, Garner reports about the top trends.”*

*“Well, I think it pretty much depends on where you want to start the company. I think the context or the environment is one factor”*

Student B



Out of four students discussing the Pilot-in-the-Plane versus Inevitable Trends debate, three followed the effectual Pilot-in-the-Plane principle, while one used the causational Inevitable Trends principle. We interpret this to mean the Students follow the Pilot-in-the-Plane principle.

### **Student Prototype**

When looking at the students we could not find a connection between which year of the program they were attending, and which theory they were following.

Students were concerned about the causational Expected Return. However, overall they followed the effectual option in the four remaining categories. Principally effectual thinking and practices seemed to dominate their thinking and approach to entrepreneurship. We can also see from Figure 8 three students were clearly effectual, while two were in the middle between causational and effectual. In total we can see that the prototype is more on the effectual side than the causational side. Our cross-case explanation building demonstrates students are effectual. Figure 8 further shows clustering by the prototype, and we can interpret their effectual preference to demonstrate literal replication.

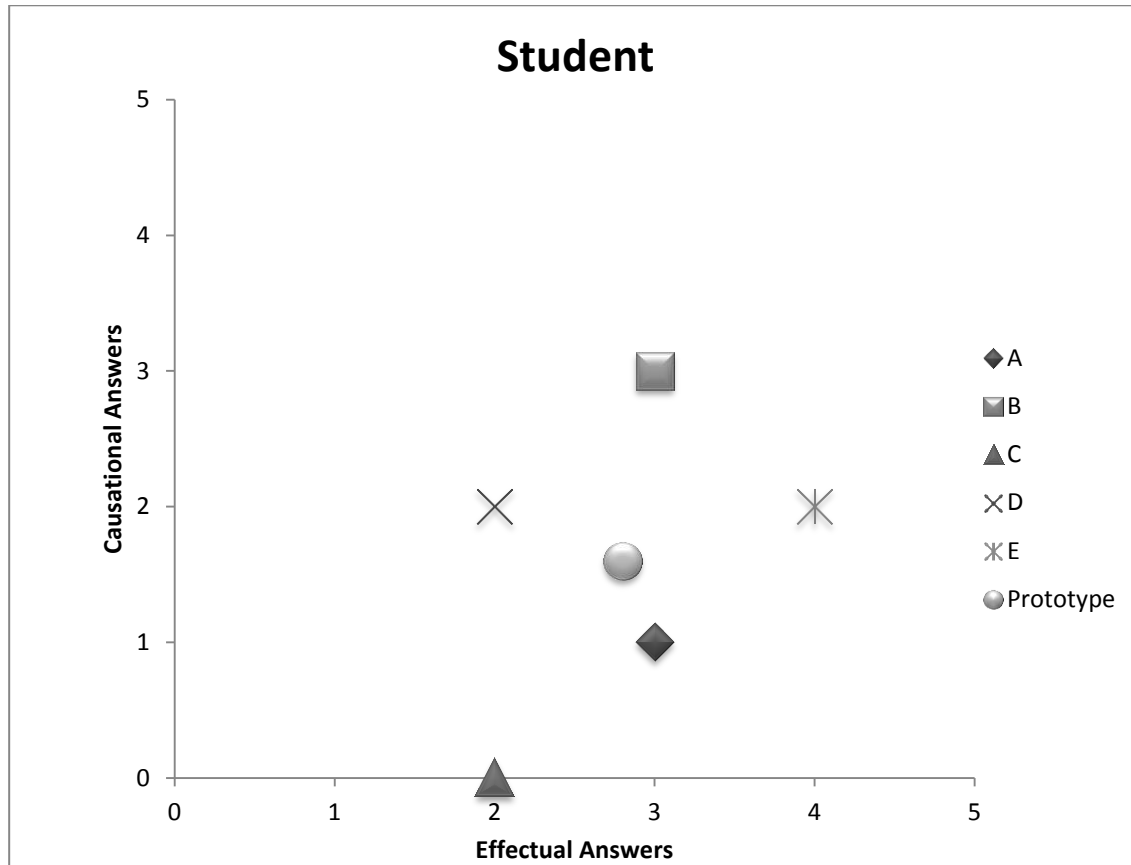


Figure 8: Students' effectuation and causation indexes

### 4.3 Cross-Group Comparisons

Looking at how the Expert, Entrepreneur, and Student prototypes compare with each other, we attempt to answer our research question: *How do entrepreneurship students' perceptions of venturing, in the context of causation and effectuation, compare to experienced entrepreneurs' paths to success?* Our analysis revealed the prototypical Expert is mostly effectual, except for a tendency to avoid surprises. We also found the prototypes for the Entrepreneurs and Students are effectual. Looking at Figure 9, we can see the prototypes for Students and Experts are relatively close compared with the Entrepreneur prototype. However, Students seemed very concerned about getting investments. In fact, they discussed it far more than the Experts and Entrepreneurs.

The close proximity of the Student prototype to the Expert prototype is encouraging. However, care should be made in reading too much into this as a reflection of high quality training. After all, their close positions do not take into account the nature of representing

entrepreneurship students and successful entrepreneurial individuals. Their context and implementation of causational and effectual principles may be quite different. For example, the Expert prototype is reflecting the perspectives of those who have come a long way from just starting up. Meanwhile, the Student prototype is representing the views of students discussing a highly hypothetical situation. With this in mind, there are still useful insights to draw from as a guide to future research.

Table 16 presents a breakdown of which principles the different interviewees were effectual (E), causational (C), or both (E/C). Here we can see the Experts and Students reflect a similar breakdown of the effectuation and causation logics. The largest difference being between their emphasis on Avoiding Surprises (Experts) and Expected Return (Students). However, the difference between the two is not terribly large. It is interesting that Experts are by definition likely to have more to lose than Students.

Effectuation / Causation	Experts				Entrepreneur				Student					
	A	B	C	D	A	B	C	D	E	A	B	C	D	E
<b>Bird-in-Hand/Pre-set goals and opportunities</b>	E/C	E	E	E/C	E	E/C	E	E	E	-	E	E	C	E/C
<b>Affordable Loss / Expected Return</b>	-	C	E/C	E/C	E	E/C	E	E/C	E	C	C	-	C	E/C
<b>Lemonade / Avoiding Surprises</b>	E/C	C	C	-	E	E	-	-	E	E	E/C	-	-	E
<b>Patchwork Quilt / Competitive Analysis</b>	E	E	E	E	E	E/C	E	E	E	E	E	-	E	E
<b>Pilot-in-the-Plane / Inevitable Trend</b>	-	C	-	E	E	E/C	E	-	E	E	C	E	E	-

Table 16: Collected coded response of the interviewees. Empty cells represent interviewees without data coded to the principles.

One reason Experts may be more causational when it comes to using Expected Return and Pre-set Goals and Opportunities is that their firms are more established and could have more entrenched interests. Most of the Experts have stakeholders in their companies that require results, reports, goals, and contracts obligations to be met. Further, institutional norms may impose expectations on performance through predictions of the future.

Entrepreneurs and Students may have more freedom to pursue various effects using their means. As Sarasvathy put it, in describing pursuit of effects through means, it can be "...to simply pursue an interesting idea that seems worth pursuing (2001, p. 244)." The statement is a stark contrast to an organization's decision process. As mentioned in section 4.2.1, Expert D talked about how his company's focus has changed a bit because the company has gotten bigger: "Of course the bigger you grow the more firm plans you need. So right now we are

*working more deliberately towards certain goals compared to some years ago.”* In the same line of thought, many of the Experts have more to lose than Entrepreneurs, especially more so than Students. These contextual elements may explain the Expert prototype’s more cautious approach to planning than both the Entrepreneur and Student prototypes’ processes.

Reviewing Table 16, we can see the Entrepreneurs and Students overlapped in Bird-in-Hand, Lemonade, Patchwork Quilt, and Pilot-in-the-Plane principles. However, we also find Entrepreneurs were more effectual in their business venturing actions. This may be due in part to the Entrepreneurs’ real business experience and ‘being in the thick of it’, whereas the Students were often discussing hypothetical situations. The Students further distinguished themselves from the Entrepreneurs in discussing more causational startup processes. The strong tendency to focus on investors and business plans was opposite from the Entrepreneurs. Rather than focusing on Expected Returns, the Entrepreneurs focused on the Affordable Loss principle. Additionally, the Entrepreneurs saw writing a business plan as a means to an end; they wrote them due to institutional norms and organizational prerequisites, such as the requirements of Forskningsparken. On the other hand, the Students seemed to believe investors were necessary for a startup. Perhaps bringing the greatest contrast to the Students’ concern for investors is Entrepreneur B’s comment regarding investors:

*“So, I think they are so different that I think you can have a professional view on this and say I’m an entrepreneur and I start businesses. And, four out of five will go bankrupt and I don’t feel sorry for anyone. The investors, I don’t feel sorry for them. They’re rich usually.”*

One reason for why the Students seems to be so concerned about investments and Expected Return, in comparison to the Experts and the Entrepreneurs, might lie within the focus of the program the Students are attending. Students seem concerned about raising money before starting up, instead of using the Affordable Loss principle, which focuses on the downside of risk. Maybe Experts and Entrepreneurs, who we also find effectual, are focusing more on things they can control when it comes to generating capital. They believe in or know what they are doing on a day-to-day basis can create an income. This is an effectual Pilot-in-the-Plane-like worldview on investments, and not causational Expected Return. Perhaps students have learned that one cannot start a venture without having your investors set. A more effectual view on investments could be added to the program.

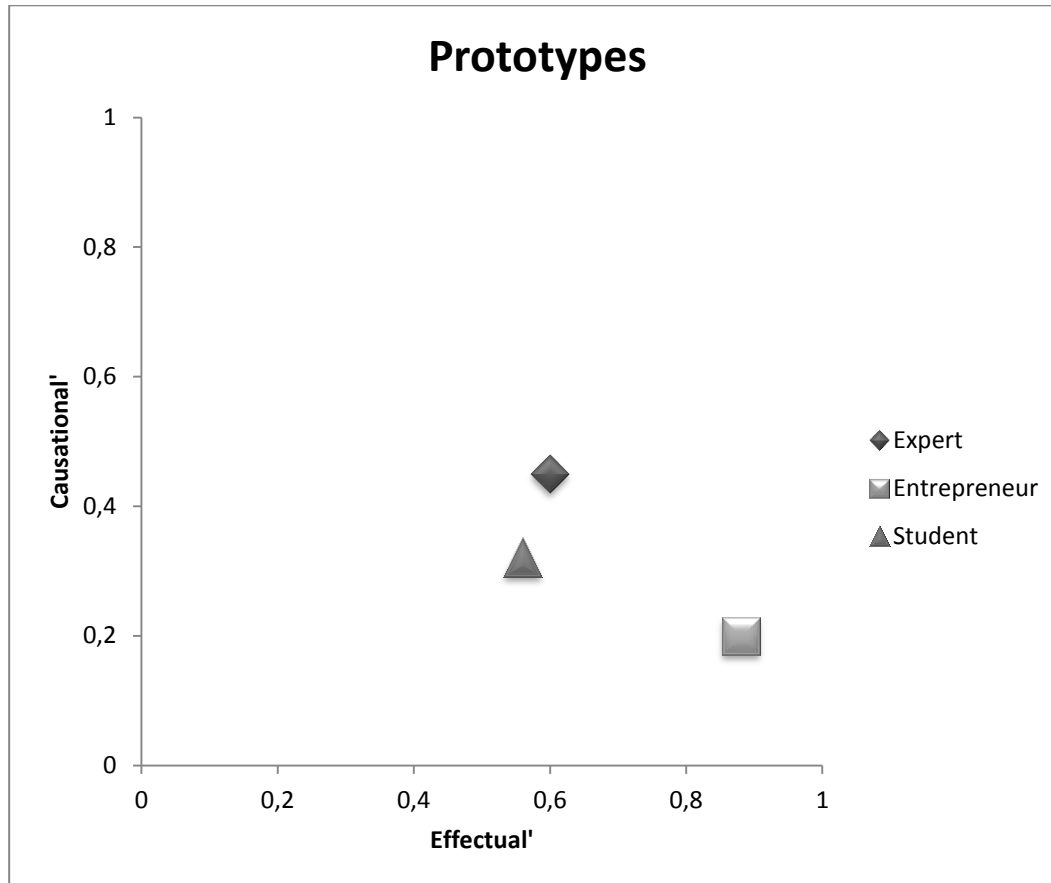


Figure 9: Normalized score of the prototypes' (Experts, Entrepreneurs, & Students) prediction vs. control index

Another interesting finding is how several of the Entrepreneurs and one Expert are doing effectuation while they seem to be thinking causation, or at least they gave the impression that they are thinking causation. They seemed concerned about giving a well planned-impression, especially when it comes to business plans. They mentioned business plans, but were only using them to get investors, and not as a part of developing the venture itself. Entrepreneur A said: *"I think the plans that I have been writing have been, yeah. It hasn't given me very much value except for one I had to write in order to get support from Innovation Norway for instance."*

# 5 Discussion

## 5.1 Propositions

From the analysis of Experts it was shown that we achieved literal replication; they behave in a way that is more effectual than causational. As shown in Figure 9 it is clear that while Experts are effectual they are also causational in certain areas. From this we propose:

*Proposition 1a: Experts are more effectual than causational.*

However, our evidence suggests Experts try to avoid surprises. Accordingly, we make the following proposition:

*Proposition 1b: Experts are causational in their surprise aversion.*

Following from our analysis of Entrepreneurs, we found our Entrepreneurs to demonstrate use of effectuation logics during their venturing process. Leading us to advocate the following proposition:

*Proposition 2a: Entrepreneurs appear to unintentionally follow Sarasvathy's effectuation principles.*

The demonstration of literal replication of Entrepreneurs using effectuation principles does not require their awareness of the theory. Indeed, it was not a surprise none of the Entrepreneurs had heard of effectuation theory, as it is relatively new and four out of five had no formal entrepreneurial or business training. Their lack of intention does not limit the replication, as Sarasvathy (2005; 2008; 2001; 2002) developed effectuation theory from observation and analysis.

Our analysis also found Entrepreneurs did use causational devices such as business plans. However, writing business plans, we found, was less about predictive planning and more about meeting the Entrepreneurs' stakeholder requirements.

*Proposition 2b: Entrepreneurs write business plans to fulfill institutional norms.*

Honig's and Karlsson's (2004) research found new firms and ventures write business plans to "conform to institutional rules and to mimic the behavior of others." Similarly, Fernandez-

Guerrero et al. (2012) found business plans are often used to attract funding, but also recommended such organization use other metrics to measure business opportunities. There are other ways of planning, and as Sarasvathy (2001) has asserted, other decision logics for planning can be used. Castrogiovanni's (1996, p. 803) proposed definition of pre-startup planning, then, becomes relevant to the type of planning logics to follow. Further, Castrogiovanni (1996) discussed the symbolism of degrees of planning and learning for business survival. Thus, while there may be other ways for interested parties to assess opportunities, our research showed our Entrepreneurs needed business plans to signal appropriate planning to at least one of their stakeholders. These were the contextual conditions at Forskningsparken.

Additionally, we found the Entrepreneurs leverage their education and skills through consultancy work to reduce financial uncertainty in the early stages. Consulting income gives them greater security while making the plunge decision. This further showed their ability to use their means to achieve an end using effectual logics in their planning. So, we propose the following:

*Proposition 2c: Entrepreneurs often do consulting work to reduce financial uncertainty during the plunge event, and thus knowledge or know-how serves as valuable means.*

Our analysis of students revealed their use of mostly effectuation principles, as seen in Table 16. However, analysis of the Student interviews highlighted their focus on investors and investments. These observations lead to two propositions:

*Proposition 3a: Students are mostly effectual.*

*Proposition 3b: Students are highly concerned with finding investors.*

We find both propositions significant. First, awareness of effectuation theory did not appear to distinguish between more or less effectual Students in our interpretation and analysis of the data. Second, much of the education literature has been on the 'scientific' side of teaching entrepreneurship. Defined by Henry et al. (2005b, p. 164) as the "*business and management functions*" of a firm. Indeed, the first semester in the Innovation and Entrepreneurship program at the University of Oslo includes three courses on management: Financial Management, Marketing Management, and Dynamic Organizing ("Programme structure," 2012). The early focus on management and understanding financial management could also

help explain proposition 3b. The Innovation & Entrepreneurship program might be too focused on investments in an Expected Return setting.

The cross-case synthesis between the three prototypes showed Entrepreneurs applied effectuation logics more often than the two other prototypes, Experts and Students. Answering, in part, our research question, we advocate:

*Proposition 4a: Entrepreneurs are more effectual than Experts and Students.*

The differences between Experts and Students revealed from the cross-case analysis and illustrated in Figure 9 lead us to make the following statement:

*Proposition 4b: Experts are more effectual and causational than Students.*

Wiltbank et al.'s (2006, p. 990) diagram of control and predictive planning shows us Experts may be closer to the 'visionary' approach to business venturing; using both causational and effectual principles as predictive and control logics. The visionary, according to Wiltbank et al. (2006, p. 990) is not only building an organization, but also its environment through imaging the future possibilities. Visionary planners are proactive in shaping the future. This is a preliminary interpretation of early nascent research.

We found Students to be more focused on investments and the investment process than the Entrepreneurs and Experts. To this end, Students differ from the two other prototypes:

*Proposition 4c: Students are the most concerned with investments.*

## **5.2 Practical implications**

Our study demonstrates effectuation and causation can serve as analytical tools for studying entrepreneurs in Norway. Further, replication of effectuation logics in two groups of practitioners in Norway's entrepreneurial community<sup>4</sup> strengthens effectuation theory as a valid business venturing process. Additionally, replication in the entrepreneurship students, three of whom had little to no prior knowledge or understanding of effectuation, plus their use of causation principles is evidence of training in entrepreneurial thinking. Clarifying the

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<sup>4</sup> One 13 of the 14 interviewees are based in Norway.



differences and principles of both theories could foster a community with visionary entrepreneurship competencies.

Further practical implications of our propositions should be considered. For example, Propositions 1b states experts are causational in their surprise aversion; it could be that they are adjusting their planning logics away from opportunity recognition. This could lead to situations of being blind to disruptive innovations. Conversely, by better understanding and continuing to incorporate both causation and effectuation processes, they could be moving towards leading visionary organizations.

Proposition 2a –Entrepreneurs unintentionally follow the effectuation principles<sup>5</sup> – supports the process as a valid delineation of entrepreneurial activity and the idea non-experts can also be effectual. Increasing awareness of alternative planning logics, such as effectuation, visionary, and adaptive the Entrepreneurs could have better frameworks to show their planning. Similarly, Proposition 2b enforces the idea that Entrepreneurs write business plans to fulfill institutional norms. As such, perhaps organizations such as Forskningsparken could change their entrance requirements to reflect the different styles of entrepreneurs' planning logics and help bring changes to institutional norms in Norway<sup>6</sup>. Perhaps there are better ways for organizations to assess an entrepreneur and his or her ideas. Regarding Proposition 2c, which states that Entrepreneurs often do consulting work to reduce financial uncertainty during the plunge event, it could be that aspiring entrepreneurs may want to find a way to commercialize their knowledge through both consulting and products. Using the consulting income to limit outside funding and increase exposure to opportunity identification. Additionally, we find Proposition 2c important in reinforcing the value of non-material resources.

Our findings that Students are mostly effectual, Propositions 3a, supports entrepreneurship education's imparting of at least some of the planning logic tools of effectuation theory and (implicitly) traditional business education. However, the impact can only be known once entrepreneurship students start business ventures. Students' concern with finding investors, Proposition 3b, reinforces the Centre for Entrepreneurship's ability to teach the predictive planning logics of causation as well. The program could find a way to more clearly develop

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<sup>5</sup> This was shown by a few Entrepreneurs describing personal styles in line with effectuation theory, but who also mentioned they think one should probably be more prediction based.

<sup>6</sup> All Entrepreneur interviewees are based in Norway and located in Forskningsparken.

the different planning logics. For example, dedicated instruction on the venturing processes of causation and effectuation could provide a more methodical understanding of the two process employing predictive and control decision logics, respectively.

If Propositions 2c, 3b, and 4c are indeed true; then the Centre for Entrepreneurship would be advised to adjust its curriculum to include more focused training for students to assess their means.

Propositions 1b and 4b together remind us of the possibility our Expert prototype could fall into the visionary category of Figure 1. The causation principle of Avoiding Surprises through planning would likely need to distinguish between those who do not seek surprises, but have a knack for turning them into opportunities versus those who see them only as barriers. Surprise aversion among our Experts included attempts at reducing operational and competition uncertainty, as defined by Liao and Gartner (2006, pp. 25-26). Expert's operational and competition surprise avoidance in parallel with Proposition 4b is thus an indication of visionary potential. This is further bolstered by Delmar and Shane (2003, p. 1167) idea that *"Planning facilitates faster decision making by identifying missing information without first requiring the commitment of resources."* Knowing what critical information is missing may count as an important step towards shaping their environment.

Continuing with this interpretation from Proposition 4b, we can see Propositions 3a and 4a would indicate Students and Entrepreneurs would benefit from further incorporation of both causation and effectuation logics. Further, the replication of effectuation in both Entrepreneurs and Students indicates Forskningsparken and the Centre for Entrepreneurship may be transformative organizations. Based on these early interpretations of the data, Forskningsparken and the Centre for Entrepreneurship are advised to assess their organizational frameworks to perhaps include both causation and effectuation theories. After all, if our interpretations and Wiltbank et al. (2006, p. 985) are correct, then further extrapolation to Figure 1 suggests Forskningsparken and the Centre for Entrepreneurship have the potential to support or be visionary organizations and business leaders.

### **5.3 Limitations of the study**

Though this has been an extensive exploratory study of Experts, Entrepreneurs, and Students, a limitation has been the short time period of this research project. This study is only a

snapshot of the participants' viewpoints while a longitudinal study would improve the results greatly. Aspects that could be improved by performing a longitudinal study are the response rate and insight into the evolution of the participants' perspectives. We contacted 32 possible participants and 14 were willing to let us interview them. Three of those were contacted because of the researcher's network connection to them and another five were students who we have had previous contact with. Not considering these, only six out of 24 unknown participants answered our request for an interview. That means that we only had 14 subjects for review and when comparing that to for example the article by Brinckmann et al. (2010) where they had a total of 52 firms to study, it is clear we are at a bit of a disadvantage when trying to present absolute proof.

Because of the limited response rate we only had two female participants, this, however, should not affect our study greatly. Sarasvathy only had male participants in her study (2008, p. 22); however, she mentioned that this was not a limitation because of the small percentage of female highly successful entrepreneurs. We only had two female entrepreneurs who fit our criterion from Forskningsparken and they were not available for our interview. Unfortunately we knew no female Experts that we could interview; however, two of the students we interviewed were females.

Another limitation of this study is its difficulty to interpret the action of participants and distinguish between effectual and causational logics. The actions mentioned in this study were described by the participants and then analyzed to the best of our abilities. However, to get a deeper understanding if their actions were effectual or causational, time would be needed for a longitudinal study of the process around the actions in question.

We would like to remind the reader that our Experts do not meet Sarasvathy's exact definition (2008, p. 21). Our justification for a modified definition of expert entrepreneurs is made in chapter 3.1.3. The alteration serves as a limitation of the Experts' literal replication in this study. However, the Entrepreneur and Student literal replications are not constrained by this limitation in our Experts definition.

One limitation that applies only to the Student participants is that most of them do not have any actual experience in the matters we are investigating, so they are only talking about hypothetical situations and plans. This limitation could be eliminated by first interviewing a group of students as we have done, then repeat the interview after a timeframe where the

students have achieved some experiences within the entrepreneurship field. By doing this over a period of time we would be able to compare their answers from the different periods and see if and how experience in the field has changed their answers.

Last, another interesting group of participants that could have been added to this study are entrepreneurship teachers and lecturers. This would add another dimension to the study that would solidify our results.

## 5.4 Future research

There are a number of avenues to continue researching. One possibility is to study Students as they become entrepreneurs to see if they change in the way they act, in the context of causation and effectuation. Or, one could study Entrepreneurs in their evolution as they succeed or fail in their ventures.

Another interesting topic would be to find the reason why Students are so concerned about investments in an expected return setting. Here one can do comparative studies with other programs, to look at similarities and differences among students.

Another possibility for future research is a longitudinal study of Entrepreneurs, given the resources for further research, could use logic model analysis for a more in-depth study of their venturing process. Logic model case analysis deliberately stipulates a complex chain of events over an extended period of time. *“Either events are staged in repeated cause-effect-cause-effect patterns, whereby a dependent variable (event) at an earlier stage becomes the independent variable (causal event) for the next stage (Peterson Bickman, 1992; Rog & Huebner, 1992) ”* (K. Yin, 2009, p. 149). Such studies may reveal how significant the differences are between the three prototypes.

It would also be interesting to look into Fernandez-Guerrero et al’s (2012) view on how a business plan is only something entrepreneurs use to get hold of funding, and how venture capitalists and public agencies should measure the quality of an idea or entrepreneurs in a different way. They should rather look into the entrepreneur’s experience, education, motivation and so on (Fernandez-Guerrero et al., 2012). As we made a connection to effectuation, with the meaning that venture capitalists and public agencies should assess the means of an entrepreneur, when looking at a potential investment case. Here one could look at

the effectual means of successful entrepreneurs, compared to not so successful entrepreneurs. Potentially through interviewing a number of entrepreneurs, and then following them over a longer period of time. This could be used as a way to verify a more appropriate way of measuring quality of potential entrepreneurs as investment cases.

Our last proposed topic for future research is looking into how the effectual way of inviting surprises also means that you are giving yourself room to perform the art of entrepreneurship. This makes sense in the way that Sarasvathy found in her book *“Elements of Entrepreneurial Expertise”* how expert entrepreneurs used effectuation, and how people with the skill or art in entrepreneurship use effectuation as a method. Which, we believe may create room for performing the art. In this way it could be interesting to see if it is possible to make a connection between effectuation and the art, which again can become interesting in the way effectuation is taught as a method (Henry et al., 2005b; S. Sarasvathy, 2008).

## **5.5 Conclusion**

Our propositions shed light on the possible answer to our research question. The students are less effectual than the Entrepreneurs and Experts when employing effectuation logics. As Figure 9 shows, Students also fell between Experts (most causational) and Entrepreneurs (least causational) in their discussion of business venturing. This could demonstrate the education provides good grounding in prediction logics for business venturing. The exception being in the Students financing perspective, who were more causation oriented when discussing investments and financial planning. These three findings indicate the educational program might benefit from dedicating more focus on control logic methods such as effectuation. However, this is a preliminary analysis of early stage research and the findings warrant more in-depth inquiry. Further research should be done to test these propositions and investigate the extent of these differences. Expanding the research into longitudinal and event specific differences would better our understanding of the impact of entrepreneurship education and differences or similarities among the three prototypes.

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# 1 Appendix

## 1.1 Interviewee Summaries

### 1.1.1 Expert A

Expert A is the CMO of a global corporation that has customers in more than a 100 countries. The firm has offices in 30 countries and approximately 2450 employees worldwide. We were able to have a phone interview with Expert A in Norway. Expert A has an engineering degree from England and he has been in the marketing sector most of his career until he landed the position as CMO. He got this job because he has over 15 years of experience with marketing and he has worked for Company A for about 15-16 years in three different periods. Expert A does not have any formal business training and he had never started a company.

He stated that the most important aspect of running his department is to be dynamic and to be able to adapt according to what the needs in the market are. To be able to be dynamic he says it is important to have good connections with all of the companies they are in contact with. This is an example of forming partnerships and the Patchwork Quilt from the effectuation theory. By keeping close contact with partners and customers they are able to reduce uncertainty and they co-create new markets with current and new partners and customers.

To deal with unforeseen problems or events he states that it is important to be fast and responsive. Even if there is a negative event that happens, he mentioned that sometime it can become positive marketing. This can be interpreted as the lemonade principal in effectuation theory. To deal with risk, the Expert A states that he is very careful of what he says and he has to make sure that he is prepared for any question. Being planned out and cautious can be considered causational and can fit with the principle of Avoiding Surprises, he always tries to be prepared and does everything in his power to stay ahead of problems.

Since he has been with the company so long it is not strange that he says his goals, milestones, or objectives have changed as his position in the company has changed. Expert A is not aware of what effectuation or causation is but when the terms were explained to him he stated that since they were such a big company it is important to follow plans, but because the company



is in the technology sector it is also important to be able to change directions as the technology develops. By following plans as much as possible Expert A is following causational thinking, more closely: Pre-set Goals or Opportunities.

From the evidence presented here it seems as though he leans more toward a causational way of thinking even though there are aspects of his behavior that are effectual. He may lean towards causational practices because he works in such a large and established organization.

### **1.1.2 Expert B**

Expert Entrepreneur B has attended Biochemistry at University of Oslo, while he also tells us that he is first a merchant (“kremmer”). Expert B does not have any formal entrepreneurial training, however he comes from a family with strong traditions in doing business. He has sold his family business, and has since been involved with quite a lot of investments and start-ups, both things that succeeded, and things that did not. He believes that the most important aspect of starting up is to have a drive to come up with something new.

Expert B seems concerned about using one’s network, and asking people with knowledge. He shows this in his answer on how to deal with uncertainty “*Well, you just have to dive into it. And constantly look at who one can use as support. If you sit down and say, I’ll have to read this to do it on my own. That won’t work. You need to figure out - who has gone down this road before. Who can I ask? Who has the knowledge?*” Here Expert B shows how he does not have it all planned out, and he does not set the perfect goal while starting up. This is evidence of effectual thinking. This fits with partnership, but also assessing you means. Expert B is looking for someone he can ask, which will add to his means. On the question on how he deals with uncertainty Expert B explains how it is important to have people who ask you the right questions, positive people who asks “why?”, in the beginning of the process. Expert B continues:

*“A lot of the people on that show have already taken up a large mortgage (pantsatt seg til pipa). And some of those people may be asked the question ‘what on earth were you thinking when you did that?’. For instance you have something that cannot be patented, what is so unique then?, why can’t a Chinese copy this”*

*(Talks about the TV-show Dragons Den - a show where entrepreneurs pitch ideas to investor).* Here we can see how Expert B is concerned with avoiding surprises. He can get the

impression that not having a patent is a showstopper for him, and that people without patents should not go on. In effectual behavior such an event would just be a hint of a new market, and doing something else. We therefore think this is more of a causational view.

On the question about risk, Expert B explains how the company he now is a CEO at, has investors who are willing to put in money. He also says that he has written a lot of business plans, that you write them all the way through the process, and how you “play ball” with the investors. All of this is expected return and a way of having the ultimate goal. Also being dependent on investors to start something up is also a proof of expected return. This is evidence of causation.

Expert B does also plan out to do causation, however he ended up doing more of an effectual move in sort of a Patchwork Quilt setting, he said:

*“We went to a broker house and told them about our idea. When we took another step. The broker house said that we don't see how we can place this in the market. But they said “what the hell”, we find this exciting, so the brokers invested themselves as private persons.”*

Expert B was also keen on talking about politics and the Norwegian startup bureaucracy, and culture for start-up investments. Expert B had not heard about either effectuation or causation. We find support in how Expert B does both effectual and causational thinking. His focus on avoiding surprises, and expected return makes him more of a causational entrepreneur, while how he likes to get hold of the people who has had the experience is more effectual as it is part of adding something to you means. Expert B ends up in the middle, between the two theories.

### **1.1.3 Expert C**

Expert C answered our questions via email because of the time difference to where he lives. Expert C is a software engineer who got his education from China which is also where he grew up. After he graduated from school he always dreamt of doing something on his own. This shows great entrepreneurial spirit. For a long time he worked for a Swedish company in the US and when he left that company he started his own IT consultancy company. One of his largest customers was the company he used to work for. By bringing on his previous

employer to be one of his largest customers he is using entrepreneurial thinking: Patchwork Quilt.

When asked what he thought was the most important aspects of starting a company he mentioned that you have to be positive, have leadership skills and have a great network. This is also considered effectual, Bird-in-hand, as he is always looking at his means. He uses who he knows to look for new business possibilities. He also says that you have to find out what products and services you can provide the customer. To achieve this he acquired a lot of experience from his previous jobs and he has a great network of programmers and a large customer base in China.

His greatest challenge is the English language, as his mother tongue is Chinese and learning English has not been easy. When talking about unforeseen problems and events he says he always thinks 5-10 years ahead and when problems pop up he tries his best to face them and solve them. This is an example of Avoiding surprises, which is causational thinking. However, Expert C mentions that he tries to have a plan A and a plan B and he only takes the risks he can afford. This is considered a classical example of Affordable loss which is effectual thinking.

He also mentions that he did his best to write a business plan for his company which is extremely causational and considered Expected Return.

Expert C has not heard about the theory of effectuation or causation but from his answers it is not easy to place him in either of the categories. He is both effectual and causational.

#### **1.1.4 Expert D**

Expert D has completed 2 years of photography education in Sweden. He worked as a photographer for a large newspaper in Norway before he was promoted to photo editor. He was a photo editor for 7 years until he was recruited to work for a large company in Oslo that was a distributor for several different types of professional photography tools. While he was there they started to approach the digital market: transmitters and scanners. He started working with another major distributor of professional photography equipment and one of the programmers there became a good friend. When they realized that the distributor wanted to go in another direction from what they had envisioned, they started for themselves instead. They were able to start their company as a subsidiary from the original distributor that Expert D

worked with. From these events we can see that Expert D thinks effectual in the way of Bird-in-hand as he uses both people he knows and the means available to him to start a company.

Other than the company he is running now, Expert D has started several other companies and some of them are still running now. When asked what the most important aspect of starting a business is he quickly answered:

*“I think everybody says you have to believe in it, you have to understand the market and you have to have the right timing. But, very few of those points, they fall down every time you do it, but we were quite lucky, we had the right timing, we had the right know-how, and we had the right means to do it.”*

This is as mentioned earlier a great example of Bird-in-hand and effectual thinking. Since they started the company as a subsidiary their parent company funded most of their activities and they were on track from day one to make their own decisions.

One of the obstacles he mentioned they had to overcome was their small size. They knew they wanted to use partners as a way to distribute their software and when they had a finished product partners started coming to them in 95-96. Expert D talked about getting started in Norway:

*“...to sell something you need to have a distribution channel. In Norway we could handle those customers ourselves. So that was quite easy, we knew the newspapers and, I personally knew them all, so we could very easily approach them and sell new things. It was really like selling ice cream in the Sahara at summer time.”*

By 97 they had quite a large number, and by 98 they had many partners, then the problem became that they did not have the capacity to manage them. This is an example of the Patchwork Quilt from effectuation theory as they build partnerships and expand their network of customers by getting pre-commitments and reducing the uncertainty to tap into new markets.

Moving forward the obstacle became that they had problems finding someone to work with them, as they were not able to offer what other large companies could offer and that is the only reason why Expert D would consider getting investors. However, they made it through the difficult time by working a lot. He said that you couldn't expect to have a 7 hour day if

you start your own company. When asked about how he dealt with risk he laughed and said that they didn't, they just went for it and tried to solve problems that came up along the way.

*"Yeah, we just went for it and tried to solve it along the way. The good thing was that we were still, we had [parent company] there as something we owned, so if everything had collapsed we would still have jobs, an income. But, we never thought about that, we just went for it. Tried to solve everything as fast as we could."*

Here he says that even if they would fail they would still have an income, and this is considered effectuation and Affordable loss.

When Expert D was asked if he wrote any complete business plans for any of his companies he answered no, but he did say that they had quite clear ideas of what they were going to do and what they needed to do. When goals and milestones he says:

*"I think they have changed all the time according to reality, of course you want to have some goals, but sometimes you just have to admit that the goals were wrong or the market was different and you have to change it. This is good with a small organization so that you can change directions very quickly. If things are going well you can do more in that area, if it goes bad you can change it very quickly. The good thing for us is that we have the financial resources to, more or less do exactly what we want, we don't have to ask anyone. And that's the big big advantage."*

This statement is a perfect example of Pilot-in-the-plane, effectual thinking. He says that his goals change according to reality and you have to change what you can when something comes up. They focus on activities within their control and they know that when they do change goals or activities it will benefit them. They know that the future cannot be known, but they try to change directions quickly and make the future they see for themselves.

Expert D was unaware of what effectuation and causation is, but after talking with him it is clear that he follows effectual activities much more than causal activities. After an explanation of what effectuation and causation is he mentioned the following: *"Of course the bigger you grow the more firm plans you need. So right now we are working more deliberately towards certain goals compared to some years ago."* However, even though the company now has a few plans and goals, which is causal, he is still considered effectual: He showed he acted effectual by using his means and connections to start his business (Bird-

in-Hand), he knew he would still have a job even if he failed (Affordable Loss), he expanded his network of partners (Patchwork Quilt), and his company focuses on actions within their control (Pilot-in-the-Plane).

## 1.2 Entrepreneurs

### 1.2.1 Entrepreneur A1

Entrepreneur A has a master degree in informatics from the University in Oslo. During his degree he completed a class about leadership and after he graduated from the University he attended Gründerskolen where he did internships in Silicon Valley in the US. The company that Entrepreneur A is CEO of is a small company only founded in 2011. Currently they are 2 full time employees and one part time employee who helps out with accounting a few hours a week. This company is an IT consultancy company who is waiting for one great idea that they can work with for the rest of their lives.

As a part of his degree he also went abroad to Mexico to study. While he was there he started a company that provided SMS services. He started this company with another Norwegian student in Mexico and he said the other person was the investor while he was the CEO. Entrepreneur A said:

*“I had this partner who has the money, he was kind of saying that he had the money we need to invest in marketing and that kind of stuff that we needed to. And so then I felt very free to just start and then we had kind of a very long way to go from the beginning until we were actually going to earn money because we needed to develop a platform and to get contracts with telecom operators”*

Entrepreneur A

By using his partner and the money available to him he is following effectuation thinking, more precisely, Bird-in-Hand. Even though the company is still running and he is the CEO of it, he does not have a big role in the company anymore because it is so far away.

When he moved back to Norway he worked for a large consultancy company where he was involved in some innovation but he said it was mostly finding out where big companies

should go next or what small company they should buy. From his experience there he stated: *“to me it was very clear that after a year I wanted to be in these small startups like where everything is chaos and you have to find out, and do all of these things from the beginning and find solutions”*.

He did not like doing just one part over and over again, he wanted to be a part of the whole process. Further, leaving his consultancy job to enjoy the chaos of startups and coming up with solutions can be interpreted as surprise seeking mentality. Entrepreneur C enjoys using the Lemonade principle in effectuation. He also said that while he was working at the large consultancy company he felt that he didn't get any “real dirt” on his hands and he wanted to go back to doing startups. This shows that Entrepreneur A is very entrepreneurial and he enjoys being in a startup setting.

The company he is currently the CEO of is an IT consultancy company that rents out their time to their customers. When talking about starting the company he said:

*“So we just give it a try and if it doesn't work, and we need money, we can of course just find an ordinary job. So the risk wasn't that high, we didn't need to invest a lot of money at the beginning, we just found some cheap offices and we had our laptops and that's kind of what we need”*.

Entrepreneur A

This is a classic example of Affordable Loss in the Effectuation theory. They calculated what they could afford to lose and even if they failed they would have a backup plan. Right now they have a couple of products they are working with, but they are waiting for one great idea that they can work with for the remainder of their careers. Entrepreneur A said: *“So we are looking towards these kinds of directions without having any specific idea. [...] Yeah, just kind of exploring”*.

This is an example of them focusing on activities within their control and waiting for their actions to result in their desired outcome. This is exactly in line with Effectuation and the Pilot-in-the-plane.

When asked what the Entrepreneur thought is the most important aspect of starting a business he said that it is important to be involved in the whole process from beginning to end. Also, he said that having customers before you start is important. To be able to achieve these things he

used his student loans to fund his business as he worked while he was studying. By doing this he did not have to get investors to help him start the company so that he could be able to control his own business and not be dependent on others. Using his student loans shows that he uses the means he has and this is an example of Bird-in-Hand, being effectual. Also, by having a product that solves a problem it will be much easier to get that first customer. He said: *“I think that is one key idea that we will stay with now that we will finally find our next big project, that before we start we want to find a real customer who actually wants this and want to join us some way to finance this”*.

By this statement he is showing that he thinks about expanding his Patchwork Quilt, which is effectual thinking, he wants to obtain pre-commitments from a customer or someone who can become a key partner.

During his interview he mentioned that his father also was an entrepreneur so he had grown up with his father working a lot and his mother being worried about finances almost all the time. From his childhood he learned that being an entrepreneur was difficult and it took a lot of work, but he also saw that his parents worked with something that they loved to do and had fun doing it.

The Entrepreneur A did say that he wrote a complete business plan for his company, but that was only so that he could get funding from Innovation Norway and having a business plan was a requirement from them. Even though he said he only wrote the business plan for Innovation Norway, writing a business plan falls in line with Expected return, which is causational thinking. However, writing a business plan under the pressure from investors or incubators could hardly be considered causational. It could be considered a casual tactic as a strategy to bring in both funding and stakeholders to expand his Patchwork Quilt, which is considered effectual. Additionally, there is not much to lose and a lot to gain from simply writing a business plan. This shows that many times an action can be both effectual and causational.

Throughout Entrepreneur A's career his goals, milestones, and objectives have changed as he started out as a student without any real commitments to buying a house and having a family. It is more important now to have a stable income and be able to pay his mortgage every month. Even though Entrepreneur A did not have any knowledge of the theories of



effectuation or causation it was clear that he followed the effectuation theory even though he was not aware of it.

### 1.2.2 Entrepreneur B

Entrepreneur B is an established and involved professor at a Norwegian university and the leader of a research group. He started his first business over a decade ago as a means to commercialize technology in his lab and to invoice work he had been previously doing for free:

*“The second thing was that I saw some people in – around science that were earning money on science. Like having consultancy companies and other companies that sold its services to research. I thought, at that time I thought my salary was pretty low and...I thought it would be nice to have a company that I can use as a tool if I take a job for Sintef or someone, and I should get paid rather than just doing everything for free. Which is what we usually do. The company would a good way to write invoices and things like that. So, starting a company is a good idea, in general, I thought. Let’s try it.”*

As Entrepreneur B put it, he was always being asked when he would do a startup. This was in part due to his location at Forskningsparken. So, once he decided he wanted to form a firm, says it *“triggered a lot of systems.”* This brings to light Entrepreneur B’s context and means he had when he made the plunge decision. From that moment on, he has maintained an awareness of his means and affordable loss mindset best explicitly made by him: *“I – all the way along the line – all the way I could afford to lose it.”*

Additionally, Entrepreneur B extended the affordable loss principle to the company. When considering the possibility of protecting the company’s technology with patents and avoid copying from potential rivals, he articulated in his patent strategy:

*“Because, if they’re going to copy it, we – it’s possible that our patent is worth less anyway. Or, if it is valuable, we will not have the money to defend it. We will not have the power to defend it. So, it’s better to just not have any expenses on patents on this.”*

Recognizing the company would not be able to afford to defend patents, he focused on the downside of a patent and saved the company significant resources. Interestingly, he decided to

trademark the company's primary product, which he believes has acted as a deterrent to would be copiers.

The second purpose for starting his first firm never took off. Entrepreneur B expressed regret that his firm has not been able to acquire the human capital to offer scientific services and develop new materials. However, he has managed to leverage hiring a "computer wizard" to move the company towards developing scientific software. Rather staying focused on those original goals, he has been able to move the company in a new direction while still selling the original product.

Regarding business and production operations, Entrepreneur B has focused on controlling costs by using a production on demand model. In acting on business operations, he can take actions that allow the company to control the outcome. Waiting for customer orders gives his company more control.

What's striking about Entrepreneur B is his display of both causational and effectual principles. The interview primarily focused on his experience at his first company. However, he has been highly involved in another company as a board member, in which he draws contrasts between two ways of business venturing. The first company he has run in a largely effectual manner, though he still used some causational principles. For instance, setting clear goals and being adamant about knowing the market very well. In the second company, the approach has been largely causational due to the long lead time for product development.

### **1.2.3 Entrepreneur C**

Entrepreneur C has his background from automatisisation and then cybernetics, he has no formal or informal entrepreneurial training. However, he has started two firms, and is in the process of starting his third company. He started out working for a company within hydropower where he learned the name of the game, moving on to starting something on his own. He explains that he is now working within industry systems. The first thing Entrepreneur C mentioned as a key aspect in a startup was network. He personally acquired this through working part time as a consultant during his early start-up phase. He mentioned to learn just setting up a company, and the shift from individual enterprise to an "AS" as key obstacles he needed to overcome. Gaining experience and building network in the business before starting on your own, is something that adds to your means in effectuation. However, this is also

something that would fit in the theory of causation (although you are working towards a set goal, you will need network).

When it comes to uncertainty Entrepreneur C explained how he feels that this is tightly connected to the uncertainty he feels as a person, you are after all the company. In effectuation you are concerned about the risk you can take at every step, and you are not making predictions about the future, you rather focus on things you can affect. So connecting personal uncertainty to the company uncertainty may be looked upon as effectual, but if Entrepreneur C is worried about the future, then it may be an argument for causation as well (worrying about things out of his control). On the question about risk Entrepreneur C explains the following:

*“In my situation I had offers of employment at all of my customers, around. I was secured a job, around. In the industry. So I had that as a security. If things went to hell, then I could apply for a job and I would earn more there than with what I was doing. Times three, for sure. And you lose nothing. You don't lose your house, because I had (owned) nothing. I had nothing to lose, in what I was doing.”*

It is clear to see how he focuses on the downside of risk, to see what he can afford to lose. This is an almost perfect example of the affordable loss principle.

He also explains how writing business plans is a waste of time, both because it took up too much time creating income, but also since he did not know “the way to do it” and had no time to learn how to. He says:

*“He had learned how to make a business plan. Then I looked at it, and I had no idea on how to (calculate) the economy in the project 3-4 years from now. I’m not an economist. I don't know that stuff. I do one day at a time. And I also figured that writing this down, would take up a lot of time, just learning it”*

Entrepreneur C also mentions the following about business plans, and we can see in both statements how there is a crash in his non-predictive mindset and how he has worried about not knowing how to make business plans.

*“I could start with writing business plans, because I have entered a niche. However the niches are also moving in regards to markets. And the markets are also moving by*

*the years. If i write 'I am doing this', and then the market is moving, and suddenly you got no need. Then it's worth nothing."*

Entrepreneur C shows here how he is not into making predictions about the future, and he is more concerned about the things he can affect. It is interesting to see how Entrepreneur C makes an excuse about his own knowledge in economy, even though he shows clear connection to the effectuation theory. One can get the feeling that he believes that one should follow a more causational way of acting, and not in an effectual way as he self is a representation of.

There is several proof of effectuation in the interview with Entrepreneur C. Entrepreneur C clearly has an effectual method to solve things, however it seems unpurposeful. Entrepreneur C had neither heard about the theory of effectuation, nor any other economic theories.

#### **1.2.4 Entrepreneur D**

Entrepreneur D has a background from IFI at University of Oslo, he has no entrepreneurial training. The company he now works for is the first and only he has started, which he categorizes as a company in the IT industry. As one of the most important aspects of starting up a company he mentioned network, wanting to do something on your own and be willingly to invest a lot of time in what you are doing.

Entrepreneur D told us how people with the same kind of education as him have no problem of getting well-paid jobs in the market. And that they even pay more than he is making in his own firm. This is evidence of effectuation as the affordable loss principle since he here has a focus on downside, he can come back to the industry in a normal job if things go wrong.

As a key obstacle he mentioned the access to customers early in the process as important. Entrepreneur D did not mention how to get these customers, therefore it is hard to say if he is following a predictive path or not (i.e. If he was dependent on market research or not). In review of his case description, he clarified the situation as pertaining to clear industrial specifications versus customer specific concerns. Upon making contact with these customers, he learned of the unique specifications they had of his product. These were unexpected and can serve as a lemonade moment in which Entrepreneur D adjusted his goals.

Entrepreneur D mentioned how demands from serious market players were important in regard to unforeseen problems. As for risk, Entrepreneur D talked about the company's insurance deal. Entrepreneur D also told us how he had written a business plan together with them which is part of their "investment package" with their incubator. None of these are strong evidence, however the business plan is a weaker evidence for causal behavior, as it is a focus on expected return.

He also told us how the company has changed their focus on the way:

*"So, we had no clue when we started, if we have that still may also be a good question. We have learned a lot on the way. We have changed focus a bit. The things we thought we would do, have done to a certain degree, but it has not...one challenge is how you earn your money".*

This is more of an effectual viewpoint, since one is effectuating, and not working towards a perfect goal. However, this is not strong evidence. To prove effectuation we would like to see bigger changes.

Entrepreneur D did also tell us how he had written a business plan when starting up. However this was something he did through the Forskningsparken system. We interpret this as how Entrepreneur D only wrote a business plan to please the system/incubator he was starting his venture with in, Entrepreneur D said: *"We were...through Forskningsparken..(mumbling)..we were through the whole standard process with business plan and other stuff."*

All in all Entrepreneur D did not give answers easy to analyze, apart from the affordable loss principle. It is hard to place him in any category. However a weak tendency of effectuation can be found. Entrepreneur D had not heard about the theory of effectuation or causation.

### **1.2.5 Entrepreneur E**

Entrepreneur E started his company more than a decade ago in response to his dissatisfaction with his corporate experience. Having worked for fifteen years in the pharmaceutical industry as a chemist, Entrepreneur E said he had grown tired of management decisions. In his response to being asked why he had started a company and his situation, he stated:

*"If this is going to be the life in future. You know, somebody decides something and you have to jump, you know. It's like this all over, in this world these days; in our*

*business. Mergers, layoffs here and there, so on and so on. I mean, why not try to do something on your own? And be a little independent. You're definitely not independent. Especially when you have to make your own money, you're dependent on customers and your own skills. But it's worthwhile to try. And if it fails, ok...ha-ha and then you need to find another job if possible."*

This displays Entrepreneur E's practice of the affordable loss principle during his plunge decision for his business venture. However, frustration with his employer was not the only factor in his decision. Entrepreneur E had been pursuing a technology he found interesting and believed had commercial potential:

*"So I filed patents on that during one of the time when we were all laid-off<sup>7</sup> and nobody knew what to do. I knew exactly what to do. I did all my testing and experiments and everything for filing patents. So, I was fortunate in that sense. Everybody else was just looking around for jobs, I was just doing my thing. So I had something, in a way, to start up with. Both ideas and also showed/found were kind of robust, and also I had a few patents on the technology."*

Notice the above statement also shows his ability to make lemonade from the lemons of what others experienced as a bad event. Throughout the interview, Entrepreneur E made several statements characterizing a pattern of effectuation beyond the plunge event. His approach to stakeholder pre-commitment is demonstrated in his statement that:

*"We have to develop all the time. And, it's better to do it for a customer and get a few bucks for it, rather than to do it for yourself and get nothing. You might even get some feedback. You might even get some appreciation. You know? It happens! Can be some people are actually happy about what you do."*

By engaging his customers - stakeholder - in the company's product development, he is able to adjust his business to their needs and offset costs, and reduce predictions through increased controllable steps. His strong aversion to predictions and preference to focusing on control is perhaps exemplified by the following remark regarding planning and budgeting:

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<sup>7</sup> Entrepreneur E later clarified that: "I didn't get "laid off". I was actually kind of transferred and I didn't like the situation."

*“Can we afford this? Yeah, let’s buy it. Can we not afford it? Oh, no no no...we wait until we have more money or actually see it’s kind of [inaudible]. I mean, how do you put up a budget when you don’t know you get any customer next month? What’s the point?”*

Someone with a causal approach would want to analyze the situation, make predictions, and prepare a budget. Entrepreneur E does not see any value in predicting what he cannot control. Combined with his statements on the plunge event and stakeholder pre-commitments, Entrepreneur E can be said to have strong effectual characteristics.

## **1.3 Students**

### **1.3.1 Student A**

Student A has his background from construction engineering at the Oslo University College. Student A started the Innovation and Entrepreneurship program as he wanted to start up a company. After attending the program for two years he still plans to start up a company, however he says that he now understands that success is hard to obtain. Both on questions about what the most important things he has learned during the program, and what key obstacles he thinks he will need to overcome, Student A answers getting hold of the right people. Student A is concerned about acquiring the best human capital possible for the job. He also tells us how he thinks that studying Innovation and Entrepreneurship represents a different mindset. This may represent the fact that you in effectuation are leveraging your idea with the help of your set of means, you go out in the world and try to form partnerships, and you are not necessarily following the perfect plan/towards the goal (causation). However, being concerned about network and human capital may just as well be causal. So this alone will not reveal which theory Student A is following.

On the question on how he would deal with unforeseen events, such as an unforeseen patent incident, Student A answers *“Then I would have tried to work my way around it. I would not have quit for that reason. When you first start. But there might be a lot of other openings. You can twist your product into a new direction, without stepping on a patent. As an example.”* Here Student A shows how he would leverage a contingency. He will work around something which very often is represented as a showstopper. Student A will look for an upside in the downside. This is a clear representation of the effectuation theory.

Student A invites risks, and is not risk averse at all, he says *“That is what you do when you start up a company. You are seeking risk. That is what you gain, you are taking risk. That’s the reason why you do it. I would say that I would handle it well. When you are seeking for it.”*. Both in causation and effectuation theory one is looking to reduce risk. In causation you are targeting a return, and you are reducing as much risk as possible. While in effectuation theory you are following the affordable loss principle, you know how much you can risk at every step on the way, by focusing on the affordable downside. Student A does not reveal too much which of these paths he does follow. However going out there accepting risk in all steps reminds more of the affordable loss principle.

Student A does not believe in business plans, but he believes that keeping milestones is smart, however it must be possible to change them. In a causational world you are striving after that perfect goal, while in effectuation you are seeking for an effect. Student A shows how he represents a more dynamic, than static way of thinking. This is effectual.

Student A had purposely acted out effectuation through an autumn-internship at a former Innovation and Entrepreneurship student’s venture. Student A answered the following on the question if he had heard about effectuation, and if he had tried to follow that idea

*“Yes, I have tried it through [former innovation and entrepreneurship student’s] internship. There we followed it. That was how we planned things. We did not write a business plan first. We were out there selling the idea, and tried to see how the market reacted in the idea we had. We then went back to plan.”*

Although some of the evidence may be used as an argument for both theories, we see that Student A thinks and acts in an effectual way.

### **1.3.2 Student B**

Student B has a background in computer science and worked for a couple of years in IT consulting prior to joining the Innovation and Entrepreneurship master’s program. He is pursuing the master’s degree to pivot his career focus away from a purely technical role and to fulfill his ambition of working for himself with innovative technologies. After three semesters in the program Student B still intends to start a business. In his own words:



*“Yeah, because as I said, I was really into the technical field and I think – well I was a bit bored about that. All the technical stuff. Then I decided, OK I like more business, more innovation, more entrepreneurship. So then I decided to start looking into different programs around all the different universities around the world.*

However, he plans to build up his experience over the next few years prior to venturing on his own.

*“My plan is to have a bit more experience in mobile technology. That’s the thing I like so far. And then, maybe in 5 years have already something.”*

These educational and experiential goals or choices can be interpreted as Student B assessing his means and acting on aspects under his control and with limited loss. However, Student B’s behavior could also be interpreted as more causational, in that an effectuator would start the venturing or business development process on his existing means. On the other hand, educational and personal network development increases his personal means. In this way, Student B may be seen as being at the beginning of one effectual cycle towards new business formation. An effectual interpretation may be bolstered by his following statement:

*“Well I think at first, what I have seen is that you have to identify a problem – a need – and then based on your background or based off what you know, you can think: Ok, what can I do in order fulfill this need?”*

This, however, could also be interpreted as causational. The confusion arises from how the entrepreneur solves the problem. Is he seeking investors, or is it based on his resource? In this case, we see he is thinking in terms of what he can do (with his means) to solve the problem.

Potential effectual characteristics demonstrated by Student B were his statements on a business idea needing buy-in from others and making the best of unforeseen situations. Relating to the former, he sees structural or environmental barriers as the most challenging obstacles to overcome for a startup. To do so, Student B stated:

*“Well, I think you just need to have an idea that’s going to be relevant for everyone. You have think not only in you, but also in the general community.”*

That is, the idea or solution is what brings people on-board. However, the statement alone does not fully qualify as effectual. It is his elaboration that *“...you need to be flexible and*

*have to adapt a bit to the situation of the way you want to start something.”* which gives credence to an effectual interpretation of bringing in stakeholders.

Student B’s effectual characteristics were further defined when asked how he has dealt with unexpected events. His answer:

*“I think it’s just to see the positive side. Right. I mean, and then to make the most of it because it’s already there; it has already happened. So you have to think ok, what is the good point of this? What can I learn?”*

demonstrates recognition for the need to have a positive attitude towards surprises. However, this appeared to be the limit to Student B’s effectual behavior. Additionally, in light of his statements on his approach to risk and uncertainty, would seem to have a more causational process of venturing.

In confronting unforeseen events and challenges, Student B said he would preemptively define risk management processes in the business plan and have a contingency plan. When followed up with a question about dealing with uncertainty, he answered he would try to reduce uncertainty by externally analyzing the situation and get a reading on what other people think about his solution. While he would plan much of the risk management and analyze the uncertainty in a business plan, he admitted the business plan would likely go through an iterative process with changes depending on the phase of the business. Though, Student B does not believe the business goals would change.

### **1.3.3 Student C**

Student C is a student who has a bachelor in informatics from the University in Oslo. She started the Innovation and Entrepreneurs master program because while she was completing her informatics bachelor she felt that she and her classmates came up with many great ideas and products, but she noticed that most of them weren’t able to take the ideas and products to the next level.

When asked if she has ever started a company she answered “no”, but that she has started many projects. One in particular that she mentioned was a project to start publishing a magazine with an Asian Pop Culture theme. In the beginning she wanted it to be a physical paper magazine, but as she kept working with it she decided that it would be better to just

publish it as an app. However, when she started to look at what was already out there, she realized that the market was saturated with the kind of product she would want to create. This can be looked at as both effectual and causational, when she started she had an end goal of creating a magazine, which is considered causational, but when she kept working with it she realized that her plans had to change and she changed them accordingly and that is considered effectual - reconsidering your means and goals. However, the fact that she did not evolve her product to fit the saturated market is causational, if she had been more effectual she would have changed her product to fit the current market or a new emerging market. As she is moving forward with this master's program she says that she still plans to start a company one day.

Moving the interview towards the important aspects of starting a new business, she quickly stated that "The Team" is in her mind the most important aspect of starting any new business. She mentioned that with a great team you can do anything. To be able to get a great team she plans to find good people who are not too similar to herself but they make you feel good by working with them. She said: *"Well, based on what I know, or what I've learned now is that having a great team! I think, well of course the demand, but I think you can do a lot with a great team. That is the thing, you know, you have to find people that you can, that you feel good to work with, but it can't be too alike you, yeah that's hard."* This statement shows that she fits with the effectuation theory about using your means. She sets out with looking at who she knows and how she can build a great team from her contacts.

When we moved the questions toward unforeseen problems, events or uncertainty she said that she would try to deal with any problem that came up before it happened, or not at all. Student C mentioned that if you focus too much on the negative things you will not be able to reach your goals. However, she did mention that it would be wise to hire a person to take care of all the problems that pop up along the way. The way she would deal with risk would be through finding a balance between being too optimistic and too cautious. She mentioned that she had heard a few horror stories from new start-ups where they had been completely taken advantage of, and she didn't want that to happen to her. What she says here goes well with the affordable loss part of effectuation. She said she would create a balance between being optimistic and cautions which can translate to not wanting to seek "all-or-nothing opportunities".

She is sure that her goals would change in the future but that it would probably make her feel bad for the previous goals and that she is not focused on them anymore. At the end of the interview she said she knew both what effectuation and causation are and that she would most likely follow effectuation, however, that would not be a conscious choice, and rather, something that just happens. Although Student C has said and done things that are both causation and effectuation we surmise that she thinks mostly in an effectual way.

#### **1.3.4 Student D**

Student D has his background as a civil engineer in robotics. He is planning to start up a company, and still is after he has been studying Innovation and Entrepreneurship. He attended the Innovation and Entrepreneurship program due to his belief that Norway's situation as a low-innovation country, the Norwegian government will need to have a huge focus on this program. He says that he has learned a set of tools to avoid pitfalls in the real world.

Student D believes that one of the most important aspects of starting up is to solve a problem. Here Student D shows more of a causal way of thinking, at least if Student D is trying to solve "that problem" and not a "problem in general", where the first way of thinking is causal, while the second effectuation.

Student D believes that he will need to do networking to acquire this. Networking is something one will need in both effectuation and causation theory. There is no proof whether Student D represent any of them.

He also believes that one of the key obstacles in a startup is to get hold of money. In the causal world you are taking the plunge based upon how much resources you need to be able to start up. While in effectuation you are basing the plunge on the affordable loss principle. Student D clearly represent the causal expected return viewpoint.

On the question about how he would cope with unforeseen problems, he answers with unforeseen actions. In causation you are making predictions about the future, while in effectuation you are more focused on what you can control. Student D does not make predictions about the future, and we see that this is an effectual viewpoint.

While on the question about how he would deal with uncertainty he says that you have to go out and ask people, sometimes in quantitative, other times in a qualitative way. This may be a

representation of both causation and effectuation, however making predictions about the future is causal. How he would do this, and how he would use the result would make it more clear which view this is a representation of.

Student D would deal with risk in the way that he will constantly try to reduce it. In effectuation you are focusing on the risk at every step, while in causation you set a wanted return, and one is reducing all risk as a calculation of the return. It is not possible to say which Student D is representing.

While on the question about writing a business plan, Student D says “*It would be most noble and efficient perhaps to have a complete business plan, the thing is though, that sometimes you just got the idea for it. And you can hear a lot of people saying already I want to pay for it. And that. That might not always be necessary to make that business plan.*”. We are interpreting this as an effectual process, you go out and talk to people, and then you go back and assess your means. It is also a representation of the partnership-view in effectuation, you are trying to get pre commitments from people.

Student D believes in high set milestones that one really has to reach for. This is setting a perfect goal, and a representation of causation.

Student D shows how he is representing a mix of effectuation and causation. Student D had not heard about the theory of effectuation nor causation, but was keen to learn.

### **1.3.5 Student E**

Student E has a varied educational and work background. Having first received her bachelors in a humanities subject, she went abroad to teach. However, she decided a defined skill would benefit her career, so she went back to school for engineering. Student E worked at an engineering firm for a couple of years during which time she found the work unfulfilling.

Applying to and entering the Innovation & Entrepreneurship program, Student E had dual purposes. The program allowed her to live in Norway, which she wanted for personal reasons, and gave her a chance to pivot her career away from a purely technical field and still have good job prospects. Interestingly, Student E expressed discomfort with the idea of founding a company. Largely due to the high risk and uncertainty of success: “*Like, I understand that as*

*risk goes up, potential reward goes up as well. But, like I said, I don't know if I'm interested in big risks.”*

Her focus on the downside is typical of the effectuators described by Sarasvathy and the affordable loss principle. However, this could also be interpreted as the risk avoidance associated with causational practices. The key to understanding which principle it is may lie in her response to how she would deal with unforeseen problems: *“I guess the key is to be light on your feet and flexible. And, not too averse to making changes to whatever comes your way.”*

The quote demonstrates an acceptance, at least, of effectuation’s lemonade principle which cycles back to the affordable loss principle. However, the question is muddled by earlier statements regarding her interest in founding a company:

*“That's a grey area. I think I would like to work at a startup. I don't know if I want to be one of the founders because there's just so much risk involved. And, I'm sort of at the point in my life where I'm not really into big risks.”*

In answering what she thinks are the most important aspects to starting a business, Student E identified the team and idea as the most critical factors. Neither of which are exclusive to effectuation nor causation. In further explaining how she would act on an idea or putting a team with a good dynamic together, she seems to have divergent process. In order to Act on an idea, Student E seemed to use causational language. Meanwhile, in building a team, she used more effectual language. It is difficult to pin Student E as either an effectuator or causational actor. This may be due to the hypothetical nature of the questions on two levels. First, she is answering how she would envision doing something highly complex and dynamic. Second, Student E is not invested in the idea of starting her own firm.

## **1.4 Interview Questions**

### **1.4.1 Entrepreneurs and Experts**

1. What is your background?
  - 1.1. Do you have any formal or informal entrepreneurial or business training?
2. Is this the first company you have started?
  - 2.1. Why did you move onto this venture?
3. What industry would you classify your company of being in?

4. What do you believe have been the most important aspects of starting a new business?
5. How do you acquire or achieve those things?
6. What were the key obstacles you had to overcome?
7. How did you deal with unforeseen problems/events?
8. How did you deal with uncertainty?
9. How did you deal with risk?
10. How did you approach investors, partners, or stakeholders?
11. Did you write a complete business plan before you started your venture?
12. Have your goals, milestones, or objectives been constant or have they changed (significantly)?
  - 12.1. If they've changed, why and how?
    - 12.1.1. What was the result?
  - 12.2. If they were constant, would change them now looking back?
13. Are you aware of the theory of effectuation?
  - 13.1. If so, have you attempted to follow it?
14. Are you aware of the theory of causation?
  - 14.1. If so, have you attempted to follow it?

#### **1.4.2 Students**

1. What is your background?
2. Have you ever started a company or are you planning to?
3. Why did you join this program?
  - 3.1. What are the important things you have learned so far?
  - 3.2. If you were planning to start a company, are you still?
4. What do you believe are the most important aspects of starting a new business?
5. How do you acquire or achieve those things?
6. What do you think are the key obstacles to overcome?
7. How would you deal with unforeseen problems/events?
8. How would you deal with uncertainty?
9. How would you deal with risk?
10. Would you write a complete business plan before starting a venture?
11. Do you think your goals, milestones, or objectives will be constant or do you think they will change (significantly)?
  - 11.1. If you think they will change, why and how?
12. Are you aware of the theory of effectuation?
  - 12.1. If so, would you attempt to follow it?
13. Are you aware of the theory of causation?
  - 13.1. If so, would you attempt to follow it?